THE

ARCHITECTURAL MAGAZINE.

DECEMBER, 1837.

ORIGINAL COMMUNICATIONS.

ART. I. *A summary View of the Progress of Architecture in Britain during the past Year; with some Notices relative to its State in Foreign Countries.* By the CONDUCTOR.

THE year 1837 scarcely affords any marked feature of architectural progress, such as the competition for, or completion of, any great national work; but it exhibits what is much more satisfactory, a general spirit of architectural improvement in the metropolis, throughout Great Britain, and, to some extent, even in foreign countries.

In London, there is scarcely a principal street that does not exhibit some new architectural feature; public institutions and companies, and even eminent commercial houses, being alike eager to attract attention by an improved architecture without, no less than by superior arrangements within. These kinds of improvement have been going on, more or less rapidly, since the peace of 1814; and the former appears to have received a considerable stimulus, a few years ago, from the general rage for ornamenting the fronts of gin-shops and public-houses. Most of these buildings, indeed, exhibit very inferior specimens of design; but, as they have advanced a step beyond what had gone before in the same kind of houses, they ought not to be despised; and, however common it may be for architects to laugh at the splendour of the gin temples, yet it cannot be denied, we think, that to them the architects and architecture of the metropolis are considerably indebted. Among the buildings of public companies may be included the club-houses, bazaars, insurance offices, and banking-houses; and, among these, we may point to the Oxford and Cambridge University Club-house in Pall Mall, the Pantheon Bazaar in Oxford Street, and the Atlas Fire-office in Cheapside, as very handsome public ornaments. The Pantheon is deservedly admired for its interior arrangement and decoration, and the Fire-office for its exterior elevation. Among public institutions may be noticed the Surgeons' Hall in Lincoln's Inn Fields, and the City School in Wood Street, Cheapside; and a number of other schools, together with various churches and chapels, might be enume-

rated, if the object were to do more than take a cursory glance at general features. The New Palace at Pimlico has this year been taken possession of by Her Majesty, and the New Houses of Parliament commenced.

Throughout the country, architectural improvement is general. There is hardly a large town in which some church or school has not been recently erected. New markets or town-halls are completed in some places, and in progress in others; and public cemeteries and cemetery chapels are increasing every year. Perhaps the best markets completed during the past year are that at Exeter by Mr. Fowler, and that at Newcastle by Mr. Grainger. For improvements going forward in Birmingham, Manchester, Liverpool, Chester, Lincoln, Cambridge, York, and in the country of England generally, we refer to an article by Mr. Godwin, at p. 484. The town in England which is, perhaps, undergoing the greatest architectural improvements is, however, Newcastle, where Grey Street promises to be, when completed, one of the handsomest streets in England.

On looking over our Provincial Notices, under the heads of Scotland and Ireland, evidence will be found that architecture is not stationary in these countries, though we cannot point to any particular feature in either which characterises the year 1837.

Among foreign countries, France appears to take the lead; in proof of which, we refer to our Report on the public buildings in Paris, p. 542. Munich and Berlin may be considered as next in the order of architectural ameliorations; but Belgium, Russia, and even Greece, Italy, and Spain, might be cited, as will appear by the paragraphs under their respective heads in our Foreign Notices. The state of architecture in the United States is noticed p. 544; by which it appears that banking houses, hotels, and theatres are erecting, with an increased regard to architectural effect.

If the progress of architecture in Britain is considerable, that of engineering may be considered as extraordinary. The railway between Birmingham and Liverpool has been opened in the course of the year, and the following railways are in progress:— the London and Birmingham railway, which is already opened as far as Tring, and which will probably be completed in 1839; the Southampton railway, which will probably be completed about the same time; the Great Western railway, the works of which are far advanced; and the Eastern Counties' railway; the Northern and Eastern railway; the Croydon, Greenwich, and Brighton railways; and the London Junction railway; which are all more or less in progress. The works in the Thames Tunnel, that very remarkable undertaking, which, now that the company has received the assistance of government, may be

considered as national, are going steadily forward, though occasionally interrupted by irruptions of the river.

The architectural literature of the year includes the *Transactions of the Institute of British Architects* (see p. 33.), and the *Transactions of the Institution of Civil Engineers*, both of which contain many valuable papers; several pamphlets relative to the new Houses of Parliament, which contain some interesting discussions; the Report from the Select Committee on Arts and their connexion with Manufactures, which indicates an increased attention to these subjects on the part of government; a translation, with notes, of *Vicat on Mortars and Cements*, a work which was much wanted; and a *Lecture on the Dry Rot*, by Dr. Dickson, which contains information respecting the Kyanising process, well deserving the attention of builders; who, in general, do not seem to understand the mode of its application. Among the articles in the present Volume of this Magazine, the two which we consider the most valuable are those by Dr. Ure and Mr. Ritchie, on Warming and Ventilating. For critical remarks, those of Candidus are highly instructive; and there are many papers of a practical nature, by other writers, not less so. We refer our readers to the Table of Contents.

ART. II. *The Poetry of Architecture; or the Architecture of the Nations of Europe considered in its Association with natural Scenery and national Character.* By KATA PHUSIN.

No. 2. THE COTTAGE.

I. *The Lowland Cottage. — England and France.*

OF all embellishments by which the efforts of man can enhance the beauty of natural scenery, those are the most effective which can give animation to the scene, while the spirit which they bestow is in unison with its general character. It is generally desirable to indicate the presence of animated existence in a scene of natural beauty; but only of such existence as shall be imbued with the spirit, and shall partake of the essence, of the beauty, which, without it, would be dead. If our object, therefore, is to embellish a scene the character of which is peaceful and unpretending, we must not erect a building fit for the abode of wealth or pride. However beautiful or imposing in itself, such an object immediately indicates the presence of a kind of existence unsuited to the scenery which it inhabits; and of a mind which, when it sought retirement, was unacquainted with its own ruling feelings, and which consequently excites no sympathy in ours: but, if we erect a dwelling which may appear adapted to the wants, and sufficient for the comfort, of a gentle heart and lowly mind, we have instantly attained our object: we have bestowed animation, but we have not disturbed repose.

It is for this reason that the cottage is one of the embellishments of natural scenery which deserve attentive consideration. It is beautiful always, and every where; whether looking out of the woody dingle with its eye-like window, and sending up the motion of azure smoke between the silver trunks of aged trees; or grouped among the bright corn fields of the fruitful plain; or forming grey clusters along the slope of the mountain side, the cottage always gives the idea of a thing to be beloved: a quiet life-giving voice, that is as peaceful as silence itself.

With these feelings, we shall devote some time to the consideration of the prevailing characters, and national peculiarities, of European cottages. The principal thing worthy of observation in the lowland cottage of England is its finished neatness. The thatch is firmly pegged down, and mathematically leveled at the edges; and, though the martin is permitted to attach his humble domicile, in undisturbed security, to the eaves, he may be considered as enhancing the effect of the cottage, by increasing its usefulness, and making it contribute to the comfort of more beings than one. The whitewash is stainless, and its rough surface catches a side light as brightly as a front one: the luxuriant rose is trained gracefully over the window; and the gleaming lattice, divided not into heavy squares, but into small pointed diamonds, is thrown half open, as is just discovered by its glance among the green leaves of the sweet briar, to admit the breeze, that, as it passes over the flowers, becomes full of their fragrance. The light wooden porch breaks the flat of the cottage face by its projection; and a branch or two of wandering honeysuckle spread over the low hatch. A few square feet of garden, and a latched wicket, persuading the weary and dusty pedestrian, with expressive eloquence, to lean upon it for an instant, and request a drink of water or milk, complete a picture, which, if it be far enough from London to be unspoiled by town sophistications, is a very perfect thing in its way. The ideas it awakens are agreeable; and the architecture is all that we want in such a situation. It is pretty and appropriate; and, if it boasted of any other perfection, it would be at the expense of its propriety.

Let us now cross the Channel, and endeavour to find a country cottage on the other side, if we can; for it is a difficult matter. There are many villages; but such a thing as an isolated cottage is extremely rare. Let us try one or two of the green valleys among the chalk eminences which sweep from Abbeville to Rouen. Here is a cottage at last, and a picturesque one, which is more than we could say for the English domicile. What, then, is the difference? There is a general air of *nonchalance* about the French peasant's habitation, which is aided by a perfect want of every thing like neatness; and rendered more conspicuous by

some points about the building which have a look of neglected beauty, and obliterated ornament. Half of the whitewash is worn off, and the other half coloured by various mosses and wandering lichens, which have been permitted to vegetate upon it, and which, though beautiful, constitute a kind of beauty from which the ideas of age and decay are inseparable. The tall roof of the garret window stands fantastically out; and underneath it, where, in England, we had a plain double lattice, is a deep recess, flatly arched at the top, built of solid masses of grey stone, fluted on the edge; while the brightness of the glass within (if there be any) is lost in shade, causing the recess to appear to the observer like a dark eye. The door has the same character: it is also of stone, which is so much broken and disguised as to prevent it from giving any idea of strength or stability. The entrance is always open: no roses, or any thing else, are wreathed about it; several outhouses, built in the same style, give the building extent; and the group (in all probability, the dependency of some large old château in the distance) does not peep out of copse, or thicket, or a group of tall and beautiful trees, but stands comfortlessly between two individuals of the column of long-trunked fac-simile elms, which keep guard along the length of the public road.

Now, let it be observed how perfectly, how singularly, the distinctive characters of these two cottages agree with those of the countries in which they are built; and of the people for whose use they are constructed. England is a country whose every scene is in miniature. Its green valleys are not wide; its dewy hills are not high; its forests are of no extent, or, rather, it has nothing that can pretend to a more sounding title than that of "wood." Its champaigns are minutely chequered into fields: we never can see far at a time; and there is a sense of something inexpressible, except by the truly English word, "snug," in every quiet nook and sheltered lane. The English cottage, therefore, is equally small, equally sheltered, equally invisible at a distance.

But France is a country on a large scale. Low, but long, hills sweep away for miles into vast uninterrupted champaigns; immense forests shadow the country for hundreds of square miles, without once letting through the light of day; its pastures and arable land are divided on the same scale; there are no fences; we can hardly place ourselves in any spot where we shall not see for leagues around; and there is a kind of comfortless sublimity in the size of every scene. The French cottage, therefore, is on the same scale, equally large and desolate-looking; but we shall see, presently, that it can arouse feelings which, though they cannot be said to give it sublimity, yet are of a

higher order than any which can be awakened at the sight of the English cottage.

Again, every bit of cultivated ground in England has a finished neatness; the fields are all divided by hedges or fences; the fruit trees are neatly pruned; the roads beautifully made, &c. Every thing is the reverse in France: the fields are distinguished by the nature of the crops they bear; the fruit trees are overgrown with moss and mistletoe; and the roads immeasurably wide, and miserably made.

So much for the character of the two cottages, as they assimilate with the countries in which they are found. Let us now see how they assimilate with the character of the people by whom they are built. England is a country of perpetually increasing prosperity and active enterprise; but, for that very reason, nothing is allowed to remain till it gets old. Large old trees are cut down for timber; old houses are pulled down for the materials; and old furniture is laughed at and neglected. Every thing is perpetually altered and renewed by the activity of invention and improvement. The cottage, consequently, has no dilapidated look about it; it is never suffered to get old; it is used as long as it is comfortable, and then taken down and rebuilt; for it was originally raised in a style incapable of resisting the ravages of time. But, in France, there prevail two opposite feelings, both in the extreme; that of the old pedigreed population, which preserves unlimitedly; and that of the modern revolutionists, which destroys unmercifully. Every object has partly the appearance of having been preserved with infinite care from an indefinite age, and partly exhibits the evidence of recent ill-treatment and disfiguration. Primeval forests rear their vast trunks over those of many younger generations growing up beside them; the château or the palace, showing, by its style of architecture, its venerable age, bears the marks of the cannon ball, and, from neglect, is withering into desolation. Little is renewed: there is little spirit of improvement; and the customs which prevailed centuries ago are still taught by the patriarchs of the families to their grandchildren. The French cottage, therefore, is just such as we should have expected from the disposition of its inhabitants: its massive windows, its broken ornaments, its whole air and appearance, all tell the same tale of venerable age, respected and preserved, till at last its dilapidation wears an appearance of neglect. Again, the Englishman will sacrifice every thing to comfort, and will not only take great pains to secure it, but he has generally also the power of doing so; for the English peasant is, on the average, wealthier than the French. The French peasant has no idea of comfort, and, therefore, makes no effort to secure it. This difference in the character of their inhabitants is, as we have seen, written on

the fronts of the respective cottages. The Englishman is, also, fond of display; but the ornaments, exterior and interior, with which he adorns his dwelling, however small it may be, are either to show the extent of his possessions, or to contribute to some personal profit or gratification: they never seem designed for the sake of ornament alone. Thus, his wife's love of display is shown by the rows of useless crockery in her cupboard; and his own by the rose tree at the front door, from which he may obtain an early bud to stick in the button-hole of his best blue coat on Sundays: the honeysuckle is cultivated for its smell, the garden for its cabbages. Not so in France. There, the meanest peasant, with an equal or greater love of display, embellishes his dwelling as much as lies in his power, solely for the gratification of his feeling of what is agreeable to the eye. The gable of his roof is prettily shaped; the niche at its corner is richly carved; the wooden beams, if there be any, are fashioned into grotesque figures; and even the "air négligé" and general dilapidation of the building tell a thousand times more agreeably to an eye accustomed to the picturesque, than the spruce preservation of the English cottage.

No building which we feel to excite a sentiment of mere complacency can be said to be in good taste. On the contrary, when the building is of such a class, that it can neither astonish by its beauty, nor impress by its sublimity, and when it is likewise placed in a situation so uninteresting as to render something more than mere fitness or propriety necessary, and to compel the eye to expect something from the building itself, a gentle contrast of feeling in that building is exceedingly desirable; and, if possible, a sense that something has past away, the presence of which would have bestowed a deeper interest on the whole scene. The fancy will immediately try to recover this, and, in the endeavour, will obtain the desired effect from an indefinite cause.

Now, the French cottage cannot please by its propriety, for it can only be adapted to the ugliness around; and, as it ought to be, and cannot but be, adapted to this, it is still less able to please by its beauty. How, then, can it please? There is no pretence to gaiety in its appearance, no green flower-pots in ornamental lattices; but the substantial style of any ornaments it may possess, the recessed windows, the stone carvings, and the general size of the whole, unite to produce an impression of the building having once been fit for the residence of prouder inhabitants; of its having once possessed strength, which is now withered, and beauty, which is now faded. This sense of something lost; something which has been, and is not, is precisely what is wanted. The imagination is set actively to work in an instant; and we are made aware of the presence of a beauty, the

more pleasing because visionary; and, while the eye is pitying the actual humility of the present building, the mind is admiring the imagined pride of the past. Every mark of dilapidation increases this feeling; while these very marks (the fractures of the stone, the lichens of the mouldering wall, and the graceful lines of the sinking roof) are all delightful in themselves.

Thus, we have shown that, while the English cottage is pretty from its propriety, the French cottage, having the same connexion with its climate, country, and people, produces such a contrast of feeling as bestows on it a beauty addressing itself to the mind, and is therefore in perfectly good taste. If we are asked why, in this instance, good taste produces only what every traveller feels to be not in the least striking, we reply that, where the surrounding circumstances are unfavourable, the very adaptation to them which we have declared to be necessary renders the building uninteresting; and that, in the next paper, we shall see a very different result from the operations of equally good taste in adapting a cottage to its situation, in one of the noblest districts of Europe. Our subject will be, the Lowland Cottage of North Italy.

Oxford, Sept., 1837.

ART. III. *A Suggestion as to the Manner in which the dilapidated Apex of the Luxor Obelisk at Paris should be restored to its original Form.* From the French of J. J. HITTORF, Architect, Honorary and Corresponding Member of the Institute of British Architects.

(Read at the Ordinary Meeting of the Institute of British Architects, Feb. 27. 1837.)

IT would appear that the pyramidion, or apex, of the Luxor Obelisk, presented by the Pacha of Egypt to the King of the French, was in an imperfect, or truncated, state; neither terminating, like other obelisks, in a point, nor with its upper part covered with hieroglyphics. By some it was imagined that the Egyptians had left it designedly in this dilapidated condition; and by others, that the apex had been thus disfigured wantonly. Among these conflicting opinions, Monsieur Hittorff, architect of the pedestal of the obelisk, and of the improvements in the Place de la Concorde, was led to conceive the idea that the pyramidion had anciently been covered with bronze; the reasons for which supposition he has explained at length in a pamphlet just published, and of which the following is an almost literal translation.—M.I.B.A.

"ON examining with attention the Luxor Obelisk, it cannot be doubted that the state of imperfection in which its summit was found (see *figs.* 122. to 126.) was its original one; and that

the monolith which composes its shaft was never surmounted by a pyramidion entirely of granite, as were the greater number of the obelisks of Egypt and Rome. This, then, is an exception to the general rule. In fact, instead of presenting a small pyramid, whose base was equal to the upper square of the obelisk 4 ft. 11 in. by 5 ft., and the height equal to one of the sides of the lower square at the base of the obelisk, about 8 ft. square, the figure of the pyramidion is found to be as follows:— 1st, To the height of about 1 ft. 8 in., it consists of a truncated pyramid, shown in *figs.* 123. to 126., having a square base, about 4 ft. 7 in. by 4 ft. 9 in. which leaves, at the point of separation between the monolith and the pyramidion, a flat ledge of about 2 in. wide, as shown more in detail in the sections, *figs.* 127. 128. 2dly, The upper part of the pyramidion consists of a small irregular pyramid, about 3 ft. 3 in. high, above the truncated pyramid, and having a different inclination. This is the part which is unfinished. The point is but irregularly rounded; and on two of its angles, near the top, there are some notches, which, notwithstanding the irregularity of their situation and size, appear nevertheless to have been made originally, and for a special purpose. The pyramidion of the Luxor Obelisk has, consequently, neither the height, nor breadth, nor form, of the ordinary pyramidions in granite. It is not finished on all its sides; and what is particularly remarkable is, that it leaves upon the four faces of the upper arris of the monolith a continued receding superfice, or ledge, which presents the possibility of its serving as a support to a pyramidion composed of a solid substance, which, in some parts, could scarcely have been one third of an inch thick (see *fig.* 125. at E), and which, being placed thereon, completed the summit of the obelisk, without diminishing the length of the block of granite which formed the shaft. *Fig.* 122. shows a vertical profile of the summit of the pyramidion. Hence, of two things, one must naturally follow: either the pyramidion of the Luxor Obelisk has been, since its formation, exposed to the view of the Egyptians as it now is, which is scarcely probable, on account of its broken state and form, its irregular mass, and also because it was the "pendant" of another obelisk

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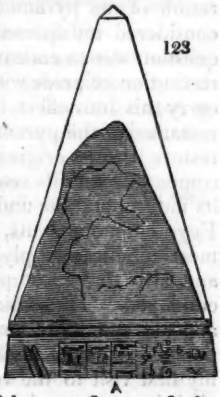

still larger, of which the pyramidion in granite is much more elevated, and appears to have the proportions generally admitted; or another material has been substituted for the granite which is deficient, so as to complete the obelisk, and leaving the pyramidion in the state we find it, without taking from the monument, by diminishing its length, any part of its importance as a monolith. The Luxor Obelisk, in its new destination, and the situation in which it is placed, cannot at Paris, any more than at Thebes, be left in its present state of imperfection; and, the restoration of its pyramidion having been considered indispensable, the point in question was to endeavour to make the restitution coincide with the intention of the original design. To carry this into effect, it was necessary not only to leave all that remained of the pyramidion, but to add to it what was requisite to restore it to its original state. On these data, which alone were compatible with its reasonable restoration, bronze appeared, from its nature, and the undeniable proofs of its analogous use in other Egyptian monuments, to be the material most suitable to supplying the given want, and also that most probably originally employed. The choice of this material appears the more probable, since the persons engaged at Luxor told me, on my first visit to the vessel in which the obelisk was brought to Paris, that they had seen, in the interior of the palace in front of which the monolith originally stood, the figured representation of an obelisk the pyramidion of which was painted yellow. This assertion being in conformity with the idea which the inspection of the pyramidion had suggested to me, converted my conjecture into certainty. However, the proposition was contested; and the prevailing objection was a very decided one; or rather, I should say, was an absolute negation, on the ground that there was no instance of a custom existing among the ancient Egyptians of using bronze gilt for the pyramidions of obelisks. Besides which, it was thought that the reflection of the sun from the brilliant surface

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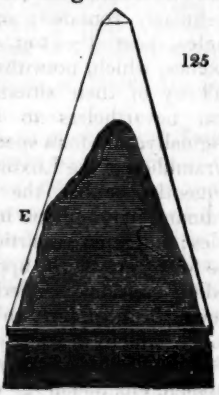

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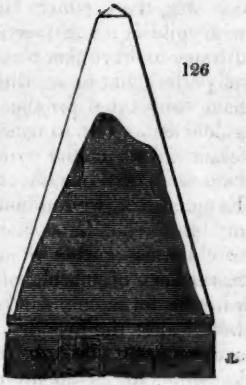
of the gilded metal would produce a dazzling effect, and not allow its form to be clearly distinguished. Any other material, it was added, which did not present the same appearance as the obelisk itself, would take from its beauty; and, consequently, only a pyramidion in granite would answer the purpose. It was principally on account of the impossibility of fixing such a block on the top of the obelisk, without destroying more or less the pyramidion which the Egyptians had preserved, that the pyramidion in bronze was proposed to be adopted, but without the addition of gilding, which I had considered to be absolutely requisite. It was, in fact, to be feared that the oxide of bronze, which would be produced on the inclined planes of the pyramidion, would spread over the obelisk, and occasion on its sides, so interesting from their hieroglyphics, green spots, which would change the colour of the granite, and deface the precious forms of the sculpture with which they are now adorned. In this point of view alone, the necessity for the gilding seemed to me sufficiently established; but, in support it, of several other considerations presented themselves. These considerations were, that the Obelisk of Luxor, put up, not in a museum of antiquities, but in the centre of the Place de la Concorde, would be there distinguished, not only as a monument most interesting from its antiquity, but likewise as an object of embellishment, which would contribute to the decoration of this magnificent square. In order to effect this double purpose, it should not be regarded as a mere object of curiosity in its mutilated state, however precious it may be in itself; but as a monument complete, or completed, and in harmony with the surrounding objects. The obelisk, surmounted by a pyramidion in bronze gilt, would have harmonised with the twenty columns which are to accompany it. In the centre of these



columns, the capitals and other parts of which will be enriched with gilding, a gilt pyramidion would have reflected in the distance the brilliancy of its surfaces. The Monolith of Luxor, in perfect harmony with the surrounding decorations, would have been the principal object, as much from its splendid aspect as its imposing size. As to whether a pyramidion different in its colour from granite would mar the conventional beauty of the obelisk, it has been decidedly negatived by the Egyptians, as well as amongst other nations, both ancient and modern, who have never hesitated to employ for the shafts of columns marble of one colour, while the capitals and the bases were of marble of a different colour, or of bronze gilt; without for a moment supposing that these different colours would alter the proportion, or destroy the effect, of an order in architecture; though this order was, of course, much better known, and its details more generally admitted, than those of obelisks. Besides, the reflection of the sun, which the objectors seem to fear (and which fear could only be founded on the supposition that it would exist constantly on the four sides of the pyramidion), could only last a few minutes each day, since the sun during the rest of the day would strike on one side only, or, at the most, on two sides at the same time. This very improbable inconvenience would be well compensated by the varied and picturesque effects of the play of light on the gilding, which would render the aspect more rich and more agreeable.

Finally, in studying the general character of Egyptian architecture (in which polychromy, or the employment of colour, predominates in its application to temples and palaces, as well as to obelisks), we see that there is nothing at variance with the belief that the Egyptians would, in certain cases, have gilded the sort of pyramidal roof which covers the summit of the obelisk. A people who were in the habit of gilding the human figure, sculptured on the cases of their mummies; who crowned their monuments (as in the instance of the tomb of Osymandias) with a circle of gold; would never have shrunk from the idea of decorating in a similar manner a species of monument which all the researches of the learned teach us was consecrated to the sun; more particularly, as the name of the monument expressed in the Egyptian language (according to Pliny) one of the rays of that luminary; and that yellow and gold were in all times, and everywhere, the emblematic colour and metal consecrated to that divinity.

If I am permitted to consider the reasons I have just stated, and which have guided me in my researches, sufficiently conclusive to convince the artists and the learned who are free from prejudices, I shall feel still more sure of their concurrence, when I add to the almost incontestable probabilities already men-

tioned some historical and undoubted proofs of the use made by the Egyptians of pyramidions of bronze gilt, to surmount their obelisks of granite. The following is a quotation on this subject from a note of M. Langlès, in his translation of *Norden* (liv. iii. p. 315.):—"Since treating of obelisks, I am enabled to record a fact relative to those of Heliopolis: that which we now see lying on the sand was overthrown the 14th of Ramadhan, 656 (Sept. 15. 1258). Under this obelisk were found more than 200 qanthârs of copperas; and from its summit was taken more than 10,000 dynârs. The summit of the obelisk, if one may credit the Arabs, was surmounted by a sort of hood of copper. This fact is taken from a historical book of Al-Maqryzy, No. 672. of the Arab MSS. in the Bibliothèque Nationale." The passage of Maqryzy to which M. Langlès refers is quoted and translated by M. Sylvestre de Sacy, in his "Observations on the Origin of the Names given by the Greeks to the Pyramids of Egypt, and on other Subjects relative to Egyptian Antiquities." (*Mag. Encyc.*, vi^me^ année, tom. vi. p. 419.) "The description of the obelisks of Heliopolis will receive some explanation from the following passages of Maqryzy, with which I shall conclude:—'The 4th Ramadhan, 656, one of the two obelisks of Pharaoh, at Mataria, in the environs of Cairo, fell down. There were found about 200 quintals of copper, and about 10,000 dynârs were taken from the top. Kodhai says: Aïn-schems (Heliopolis) is the temple (or city) of the sun. There are in this place 400 columns; and it is not possible to see anything more wonderful than these columns and their peculiarities. On the summits are two pointed caps of copper. When the Nile overflows, water flows from this summit. The two columns which are seen at Aïn-Schems, says Ebn-Djardawia, are relics of others which were formerly there. On the top of each is a covering of copper; and the water dropping from this covering descends to about the middle of the column, and renders it green and humid. Mohammed, son of Abdarrahim, says, in a work entitled *Tohfat Allabab*, that this obelisk is square, formed of a single block, pointed at the top, and raised upon a base of stone; that on the top is a covering of copper, as yellow as gold; above which is the figure of a man sitting on his chair, looking at the rising sun. That under this cover the water runs down about ten cubits, and causes a certain water-moss to vegetate; on which, he adds, drops of water are always glittering." After these quotations from a celebrated Arab writer who lived in the 14th and 15th centuries, and whom M. Sylvestre de Sacy calls the Varro of Mahometan Egypt, and who has taken these particulars from three authors who have seen what they describe, it is impossible to doubt the original existence of pyramidions in bronze gilt. History is thus proved to give its support to the argument; and

it appears that, by covering the Obelisk of Luxor in the manner above recommended, we shall act in what is unquestionably the best mode of restoring it to its primitive aspect. It must be confessed, that the words "gilt pyramidions" are not to be found in the passages quoted by Maqryzy; but the expression of Mohammed, that "the copper was as yellow as gold," leaves no doubt as to the application of the gilding. This fact, already strengthened by that of the pyramidion painted yellow found at Luxor, is still farther confirmed by the peculiarity of the green water which flowed down the obelisks of Heliopolis, from beneath the covering in copper; and which authorises the conjecture, that there existed some apertures (probably accidental), through which the evaporation of the waters of the well penetrated, collected into drops, and then ran down the stone. Had it been otherwise, the exterior surfaces would have been oxidised, and would have become green; and, consequently, if they appeared yellow, like gold, they must have been gilded. It is thus clear that, if the obelisk were now surmounted by a gilt pyramidion, it would not be the first time it was thus adorned; and the monolith would have presented itself to the admiration of the inhabitants of Paris, such as it was when admired, nearly 4000 years ago, by the inhabitants of Thebes.

My attention has since been drawn to a very interesting English work, *On the Topography of Thebes;* in which I find, at p. 316., an ample confirmation of my ideas on the point in question.

Subsequently to my writing the above essay, it has been decided that the pyramidion of the Obelisk of Luxor shall be restored in mastic. This restoration, the absurdity of which will soon be proved by the rain and frost, is of little consequence, since it will not prevent us from having recourse to the bronze gilt pyramidion, which I have so strongly recommended.

ART. IV. *On Church Architecture, with Designs for a Church.* (Figs. 129. to 132.) By F.

THE great number of new churches which have been lately erected, "however their architects may have been limited in other respects, certainly allowed great diversity of design; instead of which they look one and all as if done up from the same receipt." This is the observation of your correspondent Candidus; and I am right glad that one so able has commenced an attack which, in time, must overthrow designing according to custom. For the present, I shall speak only of church architecture as it is. To begin with the beginning, we will suppose a plan to be set before an architect, of a church which he has built, or is about to build; and that he is asked why he has

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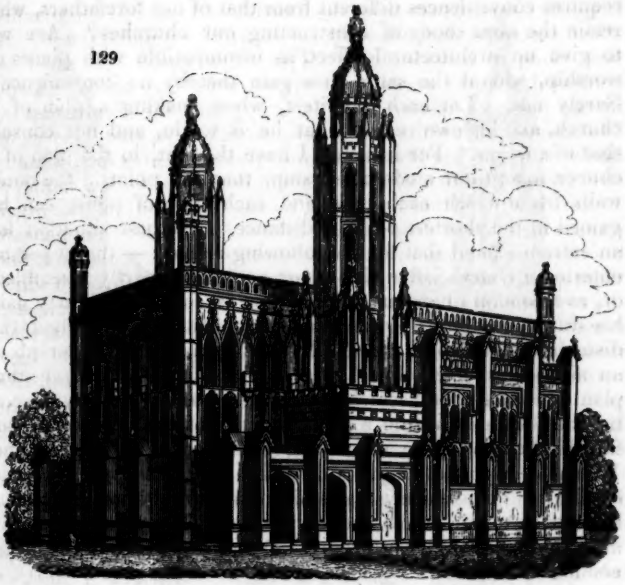

placed the tower and entrances at the west end of the church. His answer will probably be, Because it is customary; or, Because the architects in the middle ages did the same when they built churches; or, if he be inclined to be more candid, Because such was the case in the building from which he copied his design. Now, these are doughty reasons, and will abide examination; for, if you attempt to show any fallacy in the adopted plan, you must hurl destruction upon those examples which have been held up to us almost from time immemorial as inimitable. Alas! that our cathedral churches should be chosen as citadels upon the strength of which depend the very vitals of our present system of designing churches: for their plan is our plan, with this difference, that their buildings were large, and our buildings are small. But let us search further into this subject, by asking the architects of the middle ages why they placed the towers and entrances at the west end of the church. In words, they will not answer; but they conduct the questioner within the western porch, and cry, "Behold!" the long vista and the lofty aile answer, "It is that you may see us thus." Now, let the modern architect examine his plan, and tell us whether his reasons for a west end tower and entrance are equal to these. I will venture to answer, No. Then, if we have not the same reasons, why retain the same plan? If our mode of worship

requires conveniences different from that of our forefathers, why retain the same mode of constructing our churches? Are we to give up architectural effect, as incompatible with places of worship, and at the same time gain thereby no convenience? Surely not. Let each architect, when making a plan of a church, ask his own reason what he is to do, and not consult that of another. For instance, I have thought, in the plan of a church to suit our mode of worship, that the point in the outer walls from which each pew, and each class of pews, can be gained in the shortest possible distance, is the best situation for an entrance; and that for the following reason: — that a person entering a church, after the congregation has partly assembled, or, as frequently happens, after service is commenced, may gain his sitting as soon as possible, and avoid at least one half the disturbance otherwise created, by having only half the length of an aile to traverse. For the general form of the church, that plan appears the best which concentrates the greatest number of benches or pews within a given distance of the preacher; and, for this reason, a square plan is better than an oblong one. When the architect has thus consulted his reason, he is certain of obtaining convenience; and his architectural knowledge must be exerted to add effect and expression. Many difficulties will arise to oppose the easy progress of his design; but the overcoming of difficulties has always been allowed to be a source of pleasure; and it frequently happens that a difficulty overcome gives rise to a new form or combination of forms, which would otherwise have lain dormant in the mind of the architect.

I have a few observations to offer to the church architect, if he will deign to accept them, and they are as follows: — Never let the inner entrance-door open under a gallery, or the effect of the interior of the church will be irrecoverably lost. If you will have western entrances and western galleries, contrive to have porches, or a cloister, to take you to the gallery front before you enter the church. Rather prefer a western window to an eastern one; and occupy the space behind the pulpit or communion table with sculpture. A picture (say one of Raphael's cartoons) might be chosen to afford a group; and by this means you will gain an assemblage of forms well adapted for their situation as a background to the preacher; upon whom the eyes of the congregation are generally fixed: but always, in the interior of the church, introduce some little sculpture, if it be only a tablet, to remind the assembly that their purpose there is to prepare for death. In some designs, staircases may be made effective by being introduced into the churches; and, in lieu of being partitioned off by wood framing or brick walls, let them be open, and wind about a square or round pillar. To give effect, the pillar must be formed of open screen-work, finished at the

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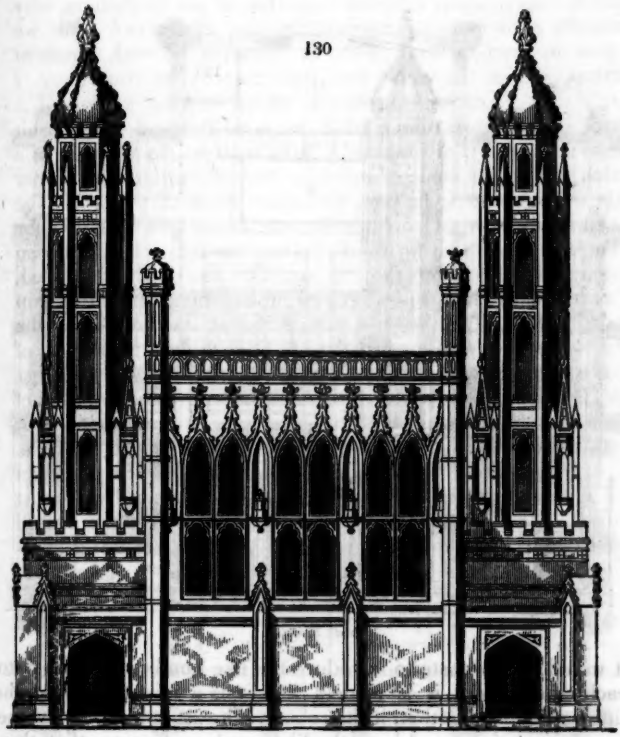

West Elevation.

top turret-like, or with a pinnacle, reaching nearly to the ceiling of the church; and the steps must be guarded by ornamented balustrades. If you have side galleries, contrive your nave pillars so as to receive an arch to support the gallery front; and, lastly, do anything you please in the interior arrangements, to avoid that dead blank western end which is the result if you adopt the usual plan. In the exterior design, remember the remarks of Candidus; and think, before you copy York Minster, that the church you are designing could be passed, tower and all, through a single window of that building. Too many and too large projecting buttresses, when seen in the perspective, hide a great portion of the richest part of your work, and likewise create too many shadows. When I say this, I speak of small buildings, because the eye has not so far to range as in large buildings, where one unbroken space of light shall equal in extent the whole size of the smaller building. Consequently,

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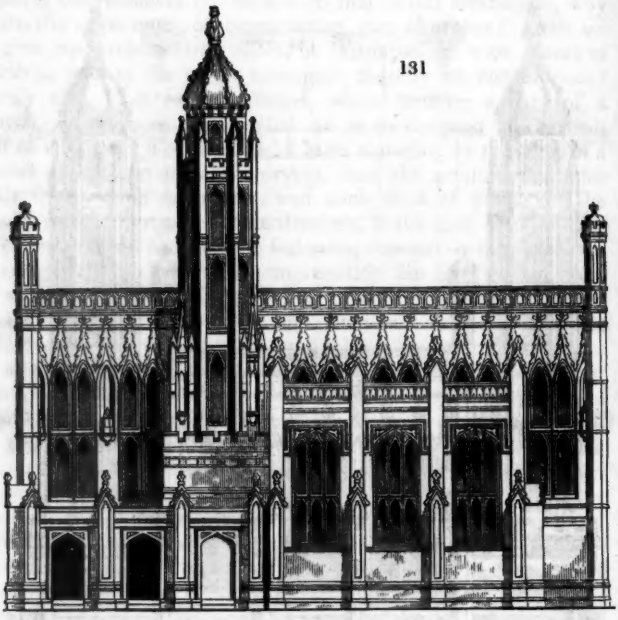

South Elevation.

it would be bad taste to introduce the like number of parts into each edifice; and it is evident that it is a mistaken notion in those who imagine that, if they observe the same laws, follow the same proportions, and have the like number of parts, that they gain the same effect in a small building as in a large one. In making choice of ornaments, never place embrasures, or other pierced battlements, against a wall. When your ornaments are chosen, place them in conspicuous situations about the building, rather than in clusters; and mind, after all, that you do not place a screen betwixt them and the eye of the spectator.

The accompanying designs for a church are made in accordance with what has been advanced; and, if effects and defects balance each other, nothing will be lost.

Fig. 132. is the ground plan. A A are porches leading to the entrances and staircases (B B); the body of the church being entered through the inner lobbies (c c); to which should be hung two pairs of folding doors, the inner doors of which should be glazed with stained or painted glass. The body of the church I should prefer fitting up with benches rather than close pews; not only on account of their being more in character with the style of architecture, but because it strikes me that they might

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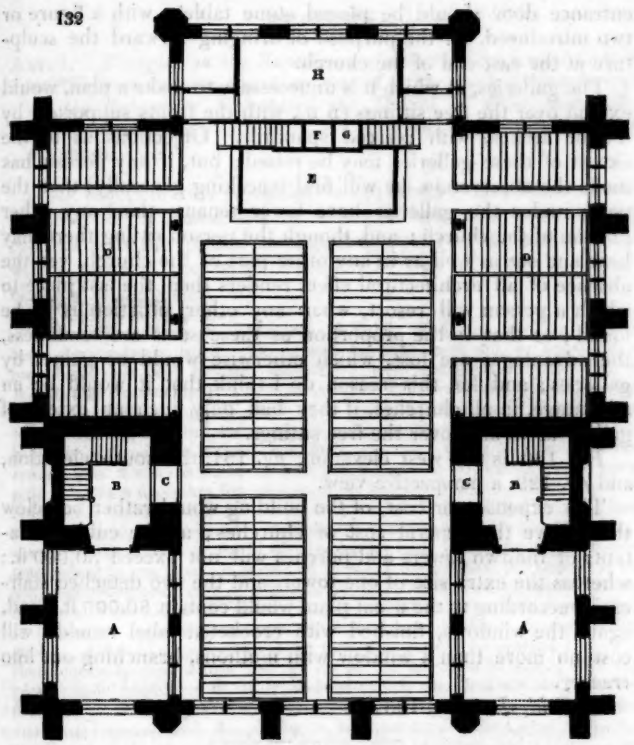

be made more comfortable. I cannot conceive why, in winter, they should send hot water up or down a pipe laid along the ailes, and then place a close framed wooden partition between the pipe and the congregation, unless it be to prevent the hot air from coming in contact with the people.

That portion of the church marked D D should be allotted for free sittings: E is the communion-table, placed in front of the pulpit (F) and the reading-desk (G), which should have paneled fronts, to receive a picture forming the background to the communion-table. The vestry and singers' seats (H) should be divided from the body of the church by a pierced screen, finished upon the same level with the gallery fronts; and above this screen should be a niche and canopy to the pulpit, designed as much as possible to improve the sound. Against the back wall, and elevated above the screen, should be some appropriate sculpture, carved in stone, which would receive a beautiful light from the two side windows. In the blank spaces over each

entrance door should be placed stone tablets, with a figure or two introduced, for the purpose of bringing forward the sculpture at the east end of the church.

The galleries, of which it is unnecessary to make a plan, would extend over the free sittings (D D), with the fronts supported by Tudor arches, with pierced spandrils. Objections as to the extent of these galleries may be raised; but, if any person has made the observation, he will find (speaking generally) that the pews under the galleries have fewer tenants than any other portion of the church; and, though the person sitting there may hear and see as well as in any other part of the church, yet the absence of all architectural effect renders them the last place to which a person will resort, when any other situation is to be found; so that, in the proportion as these seats are tenantless, the advantages are lost, which otherwise would be gained by galleries; and for this reason do I think that it would be an advantage, in all churches, if they had only such an extent of gallery as would cover the free sittings.

Fig. 130. is the west elevation, *fig.* 131. the south elevation, and *fig.* 129. a perspective view.

The expenses, or cost, of the building would rather be below than above the general cost of churches; as the cubical contents of the two towers and porches will not exceed 50,000 ft.; whereas the extra size of one tower, and the two detached staircases, according to the usual plan, would contain 80,000 ft.; and, again, the windows, finished with crocketed label moulds, will cost no more than a window with mullions, branching out into tracery.

Sheffield, January, 1837.

ART. V. *Architectural Maxims.*

THOSE ornaments which have the semblance of use ought to be employed, before the architect ventures on such as are purely decorative. Hence, when facings to the windows of a building have been omitted, it is contrary to principle to decorate any part of the elevation with sculpture, or even columns or pilasters.

Where open work in parapets is introduced, avoid Grecian pilasters, unless the house be decidedly classical in style; Gothic work, unless the style of the house be decidedly Gothic; and Elizabethan or Italian work, unless the house be in either of these manners. Derive some form for the open work from the forms of the doors or windows, or of other openings prevalent in the elevation.

The forms and lines which characterise any building as a whole, should, as much as possible, be made to characterise all its separate parts. — R.

REVIEWS.

ART. I. *Thoughts on the Expedience of a better System of Control and Supervision over Buildings erected at the public Expense; and on the Subject of Rebuilding the Houses of Parliament.* By Lieutenant-Colonel the Hon. Sir Edward Cust. Pamph. 8vo, 20 pages.

THE object of this pamphlet is to point out and illustrate the necessity of a sound system of supervision and control, with reference to the public architectural works of the country; for which purpose the reestablishment of the office of Surveyor-General is suggested.

"The office of Surveyor-General of Public Buildings has but recently been absolutely abolished. The duties formerly exercised, or supposed to have been exercised, by that officer have been transferred to the Office of Woods and Forests, now, I believe, designated, in consequence of this union, the Office of Woods and Works. He was, as the official title described, the officer who represented the public in all its dealings with architecture; but, being too well paid, at a time when little was to be done, the natural abuse ensued, that it was bestowed on unfit people, and latterly on interested ones; until it became necessary for parliament to interfere, and to effect a new arrangement. I hailed this reform at the time in my place in parliament; and, although then in habits of opposition to the government who effected it, I openly rejoiced, and approved of any change that I thought might produce amendment in practice. It is evident to me, however, that the remedy is not yet an effective one: men of business are not always men of taste; and the members of the Office of Woods have many other duties that deprive them of leisure to bestow on matters which may possibly also be foreign to their genius. I would therefore propose that they should be enabled to call to their counsels men whose abilities lay in the direction to which, with very great public usefulness in other business, their qualifications may not lead them. For this purpose I would suggest the reestablishment of the office of Surveyor-General, and the placing it in commission; the Commissioners of the Board of Woods and Forests to be *ex officio* members, and a certain number of persons, whose judgment in affairs of taste can be confided in, to be named by the crown to complete the commission; the First Commissioner of Woods and Forests to be the Chairman of the new Board, and to have the power of calling it into existence by his summons, whenever he may deem it necessary for the public service to do so. The only difficulty, and perhaps, at first sight, the *greatest* difficulty, is the proper remuneration for services which can scarcely be supposed to be 'within call' if entirely gratuitous; on the other hand, an overpaid office would again degenerate into the old abuse. I therefore recommend the adoption of a mode of payment long since practised by private Insurance Companies, that they only who attend the summons at the time specified should be paid, and that a certain fixed sum should be allotted for every such attendance. It is, I believe, a fact, which the history of the attendance on the business of Insurance Companies will corroborate, that men who would think it below their position in life to accept an office of one hundred a year, will exert themselves by regular and unremitting attention to earn by driblets no greater a sum, and will perform most useful and efficient duties when they attend; and there appears to me to be no objection to introduce the same system into the public service, even should it be found requisite to superinduce other checks than I have stated, in order to render such a system practically beneficial.

"Whatever may be the opinion of the proposition I have here thrown out, I trust the object of it will not be lost sight of, and it will illustrate the necessity of a sound system of supervision and control, if I refer to a few public works of recent completion; but, in order to avoid any invidious cavil with living architects, I will take my examples from the works of artists who can no longer be injured by my criticisms.

"For want of some presiding authority, what a heterogeneous compound of architectural taste did the late Houses of Parliament supply? No human ingenuity could have ever united James Wyatt's original Gothic and Sir John Soane's still more original Grecian. Why were they ever suffered to be so mixed together in the same building? Simply because these artists were left to their own uncontrolled discretion to carry out the full extent of their individual caprice, without any superintendence whatever. The expense of that building, if it could be sifted and brought to the knowledge of the public, would be found to have been enormous; as it must ever be when the Executive transfers the duties of supervision to men whose personal and professional interests are excited to carry out their own whims and caprices at the cost of another's purse. Take, again, the New Palace. I will not again allude to its taste; but why was it not rendered *a habitation*? It is well known that Mr. Nash was not restricted either in space or means; yet, because he was under no supervision, he threw away the advantages of both, leaving us this very bad consolation for the double expense imposed on the country, of first paying for a bad house, and then again paying for making it habitable: that Commissioners and Amateurs have had nothing to do with it, and that the dignity of art has not been compromised.

"The necessity of some more efficient superintendence over our public works would also appear desirable for the sake of the sister arts of our national school; and the great body of artists are therefore interested, for their own sakes, in desiring a better system of encouragement than what has ever been afforded them by the unrestricted discretion of their brethren of Architecture. When the opportunity has been afforded to any architect to give employment to the professors of Painting and Sculpture, these last have only enjoyed 'the crumbs that fall from the rich man's table;' and very small crumbs, I fear, they have hitherto proved to be. I am not aware that, in their extensive government employ, either Mr. James Wyatt or Sir J. Soane ever had recourse to the aid of painters or sculptors of eminence in their day to decorate their buildings. How far Mr. Nash has relieved himself from this censure in the works which he has introduced into the decorations of the New Palace, is a matter of opinion. That he never considered John Bull's pocket in the load of plaster he there embellished, and duly took his 5 per cent commission upon every employment he vouchsafed to give to his contemporaries, are the only facts that have survived for our satisfaction.

"In thus alluding to expenditure, I trust I shall not be supposed to be an advocate of that false economy, which has often been found to enlist public favour on its side from a misconception of its end and objects. It is against the *waste* of public money that I would enter my protest, and not against its liberal outlay; architectural propensities are not so ruinous in their consequences to a nation, as they are known to be to the purse of an individual. The material employed is comparatively of small value: it is the sweat of the poor man's brow, and the thews and sinews of the industrious mechanic, that shapes it to the various uses of civil embellishment and national convenience: for such objects as these the public purse ought never to be restricted, nor can they ever render a nation bankrupt (however the parallel might apply to the individual), because the Revenue must always feel the benefit of more extended employ, and a great part of the money expended in rearing a building is returned to the public treasury in various ways, before the key is turned upon it. But, when the money, liberally awarded by the Parliament, has been frittered away to gratify the caprices of interested individuals, without the ordinary check that is imposed upon even more exalted public functionaries,

and without adding to the national credit or advantage, then it is high time for the public to consider it a grievance, and to demand a remedy."

On the subject of rebuilding the Houses of Parliament, the author proposes to consider,—

"1. Whether this delay has been the consequence of, or can fairly be attributed to, the course adopted by the successive governments to obtain a design for the New Building?

"2. Whether it would be desirable to pursue the same plan of proceeding at any future opportunity, when a project of public building shall require to be again considered?

"3. Whether every precaution has been taken to give the public the assurance of a good result in the plan selected, and about to be executed?"

With respect to the first question, the author decides against government, alleging that, instead of referring the consideration of the new building to the court architect of the day, it became the crown to take the initiative.

The second question is considered at greater length: —

"The objections that have been raised against the system adopted in determining the plan have been brought forward by two or three professional men. I am not aware that any voice was raised to disparage the composition of the Commission, until after the decision had been made public; it is not, therefore, an unfair inference, that the fault subsequently found with it should have arisen from private disappointment. The complaint, from whatever motive originating, may nevertheless be just. Two facts, therefore, may be recorded in justification of the appointments made: first, that ninety-six individuals were found voluntarily to expend (according to their own statement) 10,000*l.*, in full and entire confidence of the competency of the Commissioners to do them justice; and, secondly, that, notwithstanding the well-known diversity of opinion in which the public indulge in matters of taste, more unanimity was never displayed than on this occasion. The decision of the Commissioners was ratified by both the educated and uneducated classes; nor, during the public exhibition of all the designs, were any four people ever found *to agree* upon a better and more just selection.

"It has been urged, that mere amateurs could not by any possibility be qualified to give an opinion on the subject, unless colleagued with men of professional skill or science. This has been so happily controverted by able writers in the Quarterly, and other periodicals, that it is unnecessary to repeat the refutation; but it may be useful to remind professional men, that it is not the mere apprenticeship for any given number of years in an architect's office that can constitute a judge of architecture; correctness of eye is as much a natural gift as correctness of ear; and a just taste for what is great and beautiful will often be found to preside over Architecture, as it is known to do over poetry and music, by those who could as little compose a line or a bar as draw an elevation.

"It has been further objected, in unscrupulous terms, that amateurs are liable to be biassed in their judgment by partiality and favouritism; but this must ever as much attach to professional as to non-professional men, with this difference, however, in favour of the latter, that they cannot be swayed by the *jealousies* which rivals are apt to entertain. If, however, all men are under the same condemnation as to the *imputation* of favouritism, it may fairly be supposed that those whose situation of life renders them the least accessible to the advantages of any bias are the *most likely* to be free from it: moreover, the prejudices of professional men are often extended from individuals to the rival schools in which they have been educated; and this an

amateur is necessarily free from. To these objections against the admission of professional Commissioners, which are, in my estimation, complete, I must add another, which is conclusive; that few architects would be found willing to compete if a professional brother was to be made the depositary of any little novelty or ingenuity which their talents had devised, and of which they would be most unwilling that another in their profession should take advantage. An example of this was shown in the petition of Mr. Cottingham to the House of Commons, who thought that the public exhibition of his design had furnished a hint to Mr. Barry, the successful competitor, in the revisal of his original plan.

"I cannot understand why jealousy should exist between 'those who work and those who play' at Art; the old proverb of 'Two of a trade,' &c., cannot apply, because no rivalry can exist between parties so situated: the artist must gain more by the mutual intercourse than the amateur; for, although one may gain increased knowledge, the other can not only glean a few seeds of information in the interchange of minds, but he may also turn it to profitable and advantageous account; and, in the words of my motto, I will add, 'If courts, noblemen, and philosophers do not understand art, neither painting, sculpture, or architecture can flourish.' It is time that the unworthy prejudice should cease amongst us, and that artists should look upon amateurs, not only as a body of men by whom they must principally live, but also as those who can have no other interests than the welfare and advantage of the really eminent, by the exposure and detection of the mere pretenders and quacks who occupy their places."

The third question comes next under consideration. In approaching it, Sir Edward Cust says: —

"It may be thought that it was a matter that deserved to be brought to the notice of Parliament before it voted the money for the building; but I have been deterred from this by the unjustifiable (in my opinion) exertions of those who were straining every nerve to deprive of the prize an honourable man, who had shared with them the chances of the struggle, and had fairly earned the victory; and I would not, in any way, aid the object of a few which I thought unfair and unjust towards the whole body of competitors, as well as Mr. Barry.

"The question I am about to consider is, 'Whether every precaution has been taken to secure to the public the assurance of a good result in the plan about to be adopted?' The obvious answer would be, that this is in the hands of the Executive, with whom, very properly, must rest the details to be adopted; and that it is not very much to be expected that an unofficial person like myself should know what system the proper departments of government *will* adopt, or, for all I can know, may have already adopted, to carry out the grant of the House of Commons. Of course, every man who volunteers an opinion upon any matter on which he can have no claim to be consulted, must labour under the disadvantage of ignorance of what is doing, and he must also make up his mind to the accusation of a certain amount of officiousness in the step he takes. I have but one motive in incurring the latter charge, which will, I hope, be deemed a sufficient exculpation in the eye of the public; viz. to aid the Executive in a task which, in universal estimation, has hitherto been performed in a very unsatisfactory manner; whatever, therefore, may be the estimation of any suggestions that I can make upon the subject, they cannot fail to be of more value when offered previous to the undertaking, than if presented to the public in the form of querulous criticism, when it is too late for the application of any remedy.

"As one of the Commissioners appointed by his late Majesty to select and classify the designs for the great national work of a new House of Parliament, I am desirous of placing upon record, that I consider my duties to have been concluded by the Report made by us to the King, and that the Commissioners

are unentitled to any merit or demerit which may attach to Mr. Barry's design, beyond that of their judgment as to its superiority above its ninety-five competitors. In common with the public, I unequivocally admire its grandeur as a whole, and the beauty of its details; but I have never disguised my private opinion, that it is much too highly overwrought, and that a building less richly decorated, and consequently less expensive, would be better in accordance with the purposes of a House of Parliament, and better suited to the public purse. The north front of Westminster Hall, which it is very properly proposed to incorporate into the design, looks now so bald in the midst of the paneled and pinnacled architecture that surrounds it, that it would be my advice rather to *lower the tone* (if I may borrow such an expression from a sister art) of the new Building, to suit the old, than be exposed to the necessity hereafter of *colouring up* the old to make it accord with the new. I have that high opinion of Mr. Barry's abilities, that I am convinced he has only to be *required* to do this, or in any other way to exert his taste or discretion in an alteration demanding both those qualities, in order to make any designs of his admirable: but *who is to require this at his hands?* This is the old grievance; and the public interests have been hitherto sacrificed, when we have arrived at this step of our progress. The dignity of our British artists eschews all control; and, when one could evidence on his side the presumed opinion of a Committee of Parliament, he has become supreme arbiter of his own work; and from thenceforth John Bull has been only allowed the privilege of paying for any vagaries that he may have been pleased to graft upon the design which his 'collective wisdom' has been supposed to approve of. In the present case, I take the liberty of saying, without any fear of contradiction, that neither the Commissioners, nor the Committees of Parliament, nor the ordinary Executive Department of the Office of Woods and Works, have given any *consideration* to the details of Mr. Barry's design. Some competent judges have doubted the advisability of its extension towards Abingdon Street; and no one, I believe, but the architect himself, has considered the propriety of a step that will require the purchase of the east side of that street in nearly its whole length. Others have doubted the practicability, as well as expediency, of entering the lower story of the great tower with the state coach and horses, and believe that it would be essential for that purpose to take down a considerable portion of the other side of the same street. These are serious preliminary doubts, which obviously should not be lightly hazarded in print, without a strong conviction of their truth. The public, I am sure, will have to thank me for pointing them out, even if it should find that my assertions have been made in error; since it is of the first importance to know that some competent authority has determined alterations to be necessary and advisable before they have been undertaken; but (I would add) the grandiloquent authority of a Committee is not quite sufficient, unless somewhere recorded, for the possibility of a reference being made to it; since a great deal depends upon the extent of the sanction it is calculated to convey. It might be urged, indeed, that the consent of Parliament is obtained by its silence; and, moreover, that to alter what has been *settled* in the Committees would be to invite anew the petitions and discussions of the last years. But, surely, to concede this point, would be to place the opinions and wishes of the community at the mercy of two or three discontented men, and to make that silence, which is the mere indisposition of men to interfere in matters they do not pretend to understand, more influential than the advice of the best informed, and an effective clog on the exertions of the Executive to avail itself of every opportunity to improve the plan in the execution of it. I desire, then, to impress upon the public the necessity of requiring an efficient supervision over our public works from their commencement; and I would particularly appeal to them not to be led away by the absurd supposition that this control is improper and unfair upon the architect, when it is essentially necessary for our interests, and for that of the public purse, that the same check should be placed upon the public architect, and the needless

waste of money, which has been the consequence of his irresponsibility, that is obtained by an individual in his private practice. It will naturally be supposed that this check exists already in the Office of Woods and Works. If Lord Duncannon, Sir Benjamin Stephenson, and Mr. Milne, will undertake to apply this salutary check, I have not another word to offer; but I desire to fix, by name, the responsibility of any disappointment which may hereafter accrue upon these three individuals, if no step should be taken to relieve them of this burthen. I may, notwithstanding, take the liberty of laying before the public a scheme of more efficient control than can be offered by *any* three men of whom the Office of Woods and Works might by any probability be composed."

ART. II. *The Civil Engineer and Architect's Journal.* Nos. I. and II., for Oct. and Nov. 4to. 6*d.*; or stamped, 7*d.* To be continued monthly.

THIS promises to be a very useful work, because it will cooperate with this Magazine in diffusing a more general knowledge of architecture and engineering among the reading classes of society. We presume, from the title, that the main object will be engineering, and that architecture will be comparatively secondary; but, be this as it may, we shall avoid publishing anything in the *Architectural Magazine* which has appeared in the *Civil Engineer*, in order that such of our readers as take in both works may not pay for the same thing twice over. Where information is obtained from a common source, such as published books, reports, newspapers, &c., the same matter will sometimes unavoidably appear in both periodicals; because, as both appear on the same day, it is impossible that either editor should know what will be contained in the other. Our idea is, that this mode of proceeding on our part, which will probably also be followed on that of the editor of the *Civil Engineer*, will be best both for the public and for the respective works.

The contents of No. I. of the *Civil Engineer* are, American Railways, p. 1. to 3.; Vicat on Mortars and Cements, p. 4. to 5.; Papers on Subjects connected with the Duties of the Corps of Royal Engineers, p. 6.; Notices of Godwin on Railways; Godwin's Chronological Epitome of the History of Architecture; Bennett's Original Geometrical Illustrations; Bardwell's Temples, Ancient and Modern; Donaldson's Review of the Life of Sir John Soane, in p. 7.; Address, Prospectus, and New Standing Orders of the House of Commons, in p. 8.; Present State of Architecture in England with respect to the Metropolis, in p. 9., being a sort of Reply to Welby Pugin; Hakewell on Classical Architecture, p. 10. and 11.; New Houses of Parliament; London Water Companies; Steam Navigation; Signals on Railways; Contractors' Grievances; Railways; Buildings and Public Improvements; List of Patents, p. 12. to 14.; Miscellanea and Advertisements, p. 15. and 16.

ART. III. *Minutes of Proceedings of the Institution of Civil Engineers; containing Abstracts of Papers and of Conversations, for the Session of* 1837. 8vo, 32 pages.

THE publication, by scientific institutions, of minutes of their proceedings was first adopted, we believe, by the Zoological Society; and has been found of the greatest advantage, both to members of the Society, and the public, by giving a general and correct idea of what goes on at their meetings, and an anticipation of the papers which may be expected in their *Transactions*. The present is the first publication of this kind of the Institution of Civil Engineers, and it cannot but be considered as highly creditable to that body. We trust we shall be only seconding their views in giving large extracts from it; confining ourselves to those parts which chiefly concern architects. Those papers which more decidedly embrace engineering subjects, such as steam, railways, &c., we conclude will be in the hands of every civil engineer, as there are few gentlemen of this profession in the country who do not belong to the institution.

"*Jan.* 10. 1837. — *Cements.* Col. Pasley said, that his attention had been directed to the subject of Cements, from reading in Smeaton's works that all water limes were composed of carbonic acid and clay; since, on dissolving these limes in carbonic acid, clay, of which brick could be made, was left. From this remark he had been led to make experiments similar to the following:—He took *two* parts of chalk and *one* of clay. The chalk being pounded and mixed with the clay, balls were formed, which, being burnt in a crucible, were ground and mixed as cements usually are. Some of these experiments failed; but he attributed their failure to his having used clay which was coarse and sandy; whence it appears that substances will unite when in the form of a fine powder, which will not unite when in a coarser form. These experiments were made in the years 1829, 30, 31, and 32. Subsequently, in 1836, he repeated his more successful experiments, but without the same success; and he attributed their failure to the fact of the clay (the blue clay of the Medway) containing a greater proportion of carbonate of lime than it had contained five or six years before. Continuing his experiments, he found that 4 lb. of dry chalk and 5 lb. of the moist blue clay, fresh from the Medway, made the strongest cement; but he had determined many other proportions which set immediately under water. With cement made according to the above proportions, thirty-one bricks had been set out from a wall, one brick being added every day, omitting the Sundays.

"He had cemented bricks together; and he found in every case that the bricks gave way, and not the cement. He estimated the breaking force at the joints at about 5000 lb. on the thirty-six square inches, the surface of the brick. On comparing the strength of this cement with the chalk mortar which had united some bricks more than thirty years, he was led to consider the adhesive power of his artificial cement, forty days old, as at least twenty times the power of the mortar.

"*Jan.* 31.—*Cements.* Mr. H. H. Price called the attention of the Institution to the importance of ascertaining what are really the constituent elements of artificial hydraulic mortars and cements. Several memoirs have been read before the Institute of France on this subject; but they exhibit great discrepancies as to the principles of the formation of these cements. It is of the

greatest importance to the engineer to know from the materials at hand how to make a cheap average hydraulic mortar.

" Col. Pasley remarked, that he considered Smeaton's Researches as the only ones of value. The French philosophers had followed out many of his suggestions in great detail. Two systems appear to have been pursued in France: the one in which the substances are burnt previously to their being mixed, the other in which they are mixed in a state of minute division previously to their being burnt. The Aberthaw limenstone used by Smeaton consisted of carbonate of lime and clay; *one* part of the lime from this stone, and *two* parts of sand, make a cement which sets very hard in time; but the joints must be protected at first by Sheppey, or some similar cement.

" Mr. Lowe was of opinion that very much must be attributed to the presence of silica: this evidently played a most important part. Limes have exceedingly different qualities, two makers using the same quarry would produce very different limes. If lime is flare-burnt, that is, burnt at a white heat, all the carbonic acid is driven off suddenly. The properties of lime burnt at a slow heat will differ much from the properties of the preceding. The mechanical mixing is, also, of the greatest importance. The Barrow lime is a natural hydraulic lime; but it must be well beaten with water and silica, or sand.

" *Feb.* 7. — *Cements.* The conversation on artificial cements being resumed, several members expressed their opinions on the causes to which the hardening of mortar was to be referred. Hydrate of lime is the basis of all mortars; but this will not make a water mortar, or cement, without the addition of a metallic oxide. The addition of clay will effect this; but most clays contain a metallic oxide.

" Mr. Francis Bramah gave the analysis of Dutch terras, of basalts, and of puzzolana, according to different experimenters: in all of these there is a considerable proportion of iron; and the addition of any of these to hydrate of lime will make a water mortar. Thus, it appears that we must carefully distinguish between a good mortar, and a good water mortar, or cement. Hydrate of lime is the basis of both. Good mortar depends, for its excellence, on the slow absorption of carbonic acid; and the slow absorption of this is, according to Tennant, the essential condition for good mortar. It is remarkable that, according to Pliny and Vitruvius, the Romans kept their mortar for three years; and it is now the custom among builders to bury mortar, or to keep it in a cellar: it is thus prevented from absorbing carbonic acid from the atmosphere, or, in other words, from being reconverted into limestone. According to some experiments of Tennant, it appears that mortar, in three years and a quarter, will regain 63 per cent of the carbonic acid of which it had been deprived. The absorption of carbonic acid being the condition of mortar hardening, if it be used under circumstances such that this absorption cannot take place, as under water, some other material must be supplied, and the addition of a metallic oxide appears to supply the required element.

" With respect to a hypothesis of Kirwan's, which had been mentioned, as to the peculiar properties of iron and clay, Mr. J. I. Hawkins stated a singular fact, which had come under his own observation; namely, that the rust of iron has a peculiar disposition to travel through moist clay: the rate of this transfer was, in one case, about one inch per month.

" *Jan.* 31.—*Boring Wells.* ' Description and Drawing of an Apparatus, designed by Mr. Mitchell, for boring Wells. By Mr. Mitchell, jun., of Sheerness.' This apparatus consists of a frame, similar to that of a pile engine, in which the rods are suspended. On one of the rods is a wheel, fixed on a square spindle (through which the rod can slide), and turned by means of a pinion and crank. The axis of this pinion serves, also, to draw the rods, since they may be drawn up by a single rope, or by a tackle suspended to the top of the frame, the rope of the block passing round the winch. The auger is regulated in the cut by a screw and nut; thus, the rods are always kept from bending in

the hole, and the bore from getting out of the perpendicular. This apparatus is found peculiarly convenient in chalk, and when stones are met with; since, in most cases, if the auger be sufficiently hard, the stones flash off in small chips similar to gun flints.

"*Feb.* 28. — *A new Lewis.* 'A Drawing and Description of a new Lewis, by Henry Robertson, Glasgow.' Communicated by the Author. The proposed Lewis consists of two pieces of iron, whereof each is a bent lever, connected at a joint by a strong bolt. When the upper or longer arms are drawn together by the power, the under or shorter arms, inserted into the hole, are forced against the sides; and, by properly increasing the proportion of the upper to the under arm, any necessary power may be given to the instrument.

"The advantages of this Lewis, as compared with the one of three pieces, in general use, are, that it can be inserted into and removed from the hole in far less time; it adapts itself to the form of the hole, all fitting and plugging with slips of iron being unnecessary; and, exerting its pressure directly against the sides of the hole, is less apt to chip off the edges, and endanger the falling of the stone.

"*March* 7. — *Strength of Materials.* 'On Experiments on the Strength of Materials. By Thomas Webster, M.A.; Sec. Inst. C. E.' The object of this paper was to point out the importance, in making experiments on the strength of materials, of beginning with weights sufficiently small. In the series of experiments on the strength of various timbers by Lieut. Denison, laid before the last meeting of the Institution, the first weights are in some cases too large; for, from the commencement, the deflection increases more rapidly than the imposed weight.

"The points to be ascertained in all experiments of this kind are, first, the weight which a beam can bear, the elasticity being unimpaired, or the elastic weight; and, secondly, the breaking weight. So long as the deflection increases in exact proportion with the increase of the weight, we may consider that the elasticity is unimpaired; but, if the deflection increases in a higher ratio, that is, if the deflection for 1 cwt. be 1 in., and for 2 cwt. more than 2 in., we may suspect that some violence is done to the elastic force of the material. Thus, a guide is furnished us in our observations: the weight before which this ratio is observed to change must be considered as the elastic weight. When a beam is to be broken, the effect of time should be noticed, and the increased deflection after a given number of seconds recorded.

"The experiments of Lieut. Denison bear out these remarks; for it will be seen that the point at which he has noted the first permanent set is, in very many cases, immediately after the change which is here laid down as the condition for determining the elastic weight.

"With respect to the strength of materials, Mr. Cottam stated, that it had often occurred to him whether, if a beam be loaded by ever so small a quantity beyond the elastic weight, this beam would not in time be broken. This consideration might, he thought, explain some apparent difficulties; as when a beam breaks suddenly without any increase in the weight, but having been loaded to the same amount for many years.

"Mr. Hawkins mentioned a case, in which a beam that deflected too much had been sawn down its middle and bolted up, so that its depth was increased in the centre from 10 in. to 11 in. The effect of this was, that the deflection, instead of being about 1½ in., was only one eighth of an inch. Was this great increase of strength to be attributed to the increase of depth simply, or to the lower half having become a truss, and the upper a strutt?

"*March* 14.—*Decay of Timber.* The decay of timber in contact with stone was discussed; and several instances were mentioned in which the only decayed part of timber was that in contact with stone. This decay is entirely obviated by inserting the wood in an iron shoe, or by placing a thin piece of iron betwixt the wood and the stone. Several cases were mentioned, in which the iron shoe had been found a complete protection against dry rot and decay: a

hard crust is formed on the timber in contact with the iron, which seems effectually to preserve it. It was suggested that the system of grouting must contribute to the early decay of timber: bond timber had consequently been replaced by bond iron. Bond timber is used very generally at Manchester, and answers exceedingly well; but the high temperature of the buildings may be a preventive against the decay of the timber, as the walls are very soon dried.

"*Strength of Materials.* The subject of the strength of materials was resumed from the last meeting, and especial reference was made to the experiments by Mr. Hodgkinson on the strength of iron girders, published in the Transactions of the Manchester Society. In this paper, Mr. Hodgkinson supposes the forces of extension and compression to have a ratio 1 : n; and not that, within the elastic limit at least, this ratio is a ratio of equality. Also, these experiments are directed especially to determining the form of beam which will be strongest up to the instant of fracture; or, in other words, the beam which will have the greatest breaking weight without any reference to the elastic weight.

These principles are contrary to those laid down by Tredgold, and to the opinions of many persons of great experience. Mr. Donkin and Mr. Francis Bramah maintained that within the elastic limit the forces of extension and compression are equal; that, consequently, within this limit the deflection will be the same, whether the beam is laid with a particular edge highest or lowest; that a beam, for instance, whose section is a triangle, will exhibit the same deflection within the elastic limit, whether the vertex or base of the triangle be laid uppermost; beyond this limit, however, the case is different.

"The strength of a beam, according to Mr. Hodgkinson's experiments, depends on the bottom flanche: by increasing this, he had made beams, for which the breaking weights were 4000 the square inch of surface of section; whereas Tredgold's strongest forms were about 2500 the square inch.

"*March* 21.— *Strength of Girders.* 'On the Strength of Iron Girders. By W. B. Bray, A. Inst. C.E.' In this paper, the author states the rules which had been given by Galileo, Tredgold, and Hodgkinson, for calculating the strength of iron girders. He shows by a table that Galileo's rule must be utterly false when applied to girders having large bottom flanches. Applying this rule to two girders, one of which contains double the metal of the other, they ought to be of the same strength; whereas Mr. Hodgkinson's rule makes the former only one half as strong as the latter. Tredgold gives no rule for the case of a large bottom flanche. Thus, there appears great inconsistency in these rules, and a formula applicable to all cases is still wanted.

"*Iron Girders.* 'On Mr. Hodgkinson's Experiments on Cast-Iron Girders. By Thomas Webster, M.A.; Sec. Inst. C.E.' The object of this paper was to detail the result of an examination of the above experiments, undertaken with the view of ascertaining whether those forms of beams recommended by Mr. Hodgkinson, as requiring greater breaking weight, have also a greater elastic weight than the more ordinary forms, with equal flanches at the top and bottom. The principle assumed by Tredgold (which, also, was the principle assumed by Dr. Young) is, that within the elastic limit the forces of extension and compression are equal; whereas Mr. Hodgkinson starts with the enquiry as to the law which connects the forces of extension and compression.

"Mr. Hodgkinson's experiments must be viewed as directed entirely to determining the breaking weights; and the earlier weights are not set down in many of the experiments. The weights and deflections first recorded are, in many cases, very near the elastic weight and point of permanent set; so that there is great difficulty in applying the principle already laid down for determining the elastic weight. But, in some of the experiments, which have a long series of early weights, it will be seen, on comparing the increase of deflection with the increase of weight, that this ratio changes from one of equality sooner in these forms than in those with equal flanches at the top and bottom.

If, then, these beams, with large bottom flanches do possess practical advantages, it may be from their allowing a violation of the elastic limit with comparative safety; this is a state of things, however, which ought never to be contemplated.

" *April* 4. — *Wooden Bearers.* ' Result of Experiments made with a view to determine the best Figure and Position for Wooden Bearers, so as to combine Lightness and Strength. By James Horne, F.R.S.; A. Inst. C.E.' The results of several experiments on wooden bearers of different sections are tabulated; together with the dimensions and weights of the pieces, and the nature of the fracture. The conclusion at which Mr. Horne arrives is, that a triangular prism, placed with its base upwards, is the strongest figure and position; that with an edge uppermost, the weakest for a given quantity of material.

" *Vibrations of the Soil.* The subject of the vibrations produced in the soil by the passage of locomotives and coaches was discussed; and several instances were mentioned, in which the vibration of the soil was sensible at the distance of a mile and a half during an observation by reflexion. It was stated that the experiments recently made for determining the effect which the passage of the locomotives at a small distance might have on the observations at the Royal Observatory had not been conclusive; but that, as no sensible effect could be produced on any observations but those by reflexion, no apprehension of inconvenience was entertained.

" It was also stated that a number of persons running down the hill in Greenwich Park produces a slight tremor, which is quite sensible during an observation by reflexion; and that the shutting of the outer gate of the Observatory throws an object completely out of the field of the telescope.

" *The Thames Tunnel.* ' Notice concerning the Thames Tunnel. By Richard Beamish, M. Inst. C.E.' Several attempts have been made, in former years, to effect a communication betwixt the opposite shores of the Thames by means of a tunnel; all of which, however, failed. In 1798, Dodd proposed a tunnel at Gravesend; and, in 1804, Chapman projected one at Rotherhithe; and, in 1807, Vazie commenced the construction of a shaft, 11 ft. diameter, at a distance of 315 ft. from the river. With Vazie was associated Trevethick, a man of great practical knowledge as a miner; and, by indefatigable labour, a drift-way, 5 ft. in height, 2 ft. 6 in. in breadth at the top, and 3 ft. at the bottom, was carried 1046 ft. under the river. In the spring of 1808, having first ascended from under a rocky stratum, though with a depth of at least 25 ft. betwixt them and the bed of the river, the Thames broke in upon them; and, not a single brick having been laid, the work was irretrievably lost.

" In 1823, the subject of a tunnel was again agitated, and a company was formed to carry into execution the plans of Mr. Brunel. The first proceeding was to sink a shaft. Twenty-four piles, with a shoulder on each, were first driven all round the circle intended for the shaft. One side of a wooden platform, or curb, was then laid on this shoulder, whilst the other side rested on an iron curb, having an edge below, to which it was attached. Through this curb ascended forty-eight wrought-iron bolts, 2 in. diameter, to the height of 40 ft., the height to which it was proposed to raise the shaft. The regular building of the tower on the curb, with bricks laid in cement, was proceeded with, and yet farther bound together by twenty-six circular hoops of timber, half an inch thick, as the brickwork was brought up. At the top of the tower was placed another curb; and, the long iron bolts passing through it having their ends formed into screws, the whole was screwed solidly into one mass, and completed in three weeks. In a week after it was finished, sixteen of the piles having been driven, two by two, opposite each other, the whole structure was sunk half an inch, carrying down with it the remaining eight piles, on which it was brought to a rest uniformly and horizontally, thus permitting the sixteen piles to be abstracted by opening the ground at the back. The whole weight supported by these eight piles was about 910 tons

(the weight of the shaft). Having been left for three weeks to dry, and gravel having been heaped under the curb, the remaining eight piles were removed, two by two, till the mass rested on a bed of gravel. The machinery (viz. the thirty-horse high-pressure steam engine, with gear for raising the excavated soil) was now fixed on the top. The miners were placed inside, and, by excavating from around the bottom, the whole descended by its own gravity.

" Mr. Beamish then describes the peculiar difficulties which were experienced previous to the first irruption.

" The chasm in the bed of the river, formed by the irruption of 1827, was stopped by bags filled with clay, with hazel rods passed through them; and the interstices filled by gravel. The irruption of 1828 was met by similar means; but, the funds of the company not being then sufficient for proceeding with the work, the shield was blocked up with bricks and cement, and a wall, 4 ft. in thickness, was built within the tunnel.

" For seven years the work was abandoned; till, in 1835, a Treasury loan was granted, subject to the condition that the most dangerous part of the tunnel should be executed first. On resuming the works, the first object was to provide a drain for the water from the shield, for which purpose two reservoirs were formed under the middle pier, from which drifts were formed to the bottom of the great excavation and shield. The water was abstracted from the shield at the lowest point, and the pipes of two pumps, worked by the steam engine, being brought into the reservoir, all the difficulty of the drainage was overcome.

" The removal of the old, and the introduction of the new, shield was a work of no ordinary difficulty. The bricks and cement had, by the strong oxide of iron which the water contains, been converted into a mass harder than most rocks; and not less than 1646 of surface, 342 of which constituted the ceiling, had to be supported on the removal of the brick-work previous to the introduction of the new shield. The means, however, adopted by Mr. Brunel, and which are described in the paper, were perfectly successful.

" *April* 11. — *The Thames Tunnel.* Mr. Brunel gave an account of the Thames Tunnel. Having described the nature and difficulties of the undertaking, and the previous attempts which had been made by others to effect a similar work, he explained, by reference to sections, the nature of the strata below the river. He had adopted the rectangular form of the present excavation, because the work would set better than if of any other form, and had a better sustaining surface. The necessity of supporting the ground, and of having a sufficient shelter, had led to the adoption of the shield, respecting which so much had been said. The construction of this would be understood by conceiving twelve books, set side by side on their ends. These would represent the parallel frames which, standing side by side, but not in immediate contact, fill up the excavation. Each frame is divided into three boxes, or cells, one above the other; the adjustment of the floors of which, and other details, were minutely described by Mr. Brunel.

" Each frame is furnished with two large slings, by which it may derive support from or assist in supporting its neighbours; it has also two legs, and is advanced, as it were, by short steps, having, for this purpose, an articulation which may be compared to that of the human body. The frame rests on one leg, and then one side is hitched a little forward; then, resting on the other leg, the other side is hitched a little; and so on. Hence, the shield may be called an ambulating coffer-dam, going horizontally.

" The brickwork is built in complete rings; and the advantages of this system of building had been fully proved by the fact of two dreadful irruptions having produced no disruption. Such was the violence of the irruption, that the brickwork had, in one part, been suddenly reduced in thickness by one half; and in one place there was a hole as if pierced by a cannon ball. At a few feet beneath them is a bed of quicksand, 50 ft. deep; and above them strata of most doubtful consistency, some of which goes to pieces immediately on being disturbed. Still, however, their progress is certain, and they only re-

quire patience to allow of the ground above them acquiring sufficient density. He found gravel, with a mixture of chalk or clay, extremely impervious to water: in some cases he contrived to let out the water from the sand above them, and thus obtained ground of sufficient density. In their progress they were considerably annoyed by land springs, which produced cutaneous eruptions, and destroyed the finger nails of the workmen.

"*April* 18. — *The Thames Tunnel.* Mr. Brunel gave farther explanations respecting the tunnel. He explained the way in which the ground above them had suddenly sunk down, owing to the run of a lower stratum of sand. This running sand, which was a very great annoyance, consisted of *five* parts water and *one* sand. Bags of clay and gravel are not best where there are many stones; for the interstices do not become properly filled up; but in these cases the coarsest river sand is best: the water runs through at first, but soon stops: gravel and clay mixed are nearly impervious to water, but not so impervious as gravel and pounded chalk.

"Mr. Gibb stated that he had found bags filled with clay and tow-waste exceedingly impervious to water. Being called upon to rebuild a sluice in a place where piling, owing to the stony nature of the ground, was impossible, he had formed a coffer dam, by laying down bags full of clay and tow-waste, in tiers of four, formed on the top of each other, to the surface of the water.

"The ventilation of the tunnel is effected by a pipe, 15 in. square, passing out under the fire-place of the steam-engine boiler.

four wheels by horses, the machinery being moved by the wheels of the car-

"*Levelling Machine.* 'Description of a proposed Levelling Machine, by John Harrison.' Mr. Harrison proposes to construct a machine which should make its own section of the country as it passes over it. This machine, of which the general appearance is like a caravan, is to be drawn on riage. A section is generally made by marking on the base line the lengths, and on perpendiculars through these points the heights, and joining the points so marked off; but in this machine the section is to be made by the continued motion of a point acted on by two forces, one of which would carry it in a horizontal line, uniformly with the space gone over by the machine, and the other vertically, according as the machine is rising or falling. The machine is thus divided into two distinct parts for effecting these purposes, and the way in which this may be practically effected is described in detail by reference to an isometrical drawing accompanying the paper.

"*April* 25. — *Chester Bridge.* Mr. Trubshaw presented to the Institution a model of the centre employed by him in the construction of the Chester bridge

"The peculiar features of this centre, which is described in detail in the first volume of the Transactions, consists in the absence of horizontal timbers, the timbers being so arranged that their load is received endways, and in the lagging being supported over each rib by a pair of folding wedges.

"Mr. Trubshaw entered into the details of the construction and method of striking the centre, explanatory of the account contained in the Transactions.

"*May* 2. — *Projecting Country.* Some remarks were made on the various methods which had been employed for representing the nature of a country as to levels and slopes. In one map of Warsaw the level of every point was shown; in the ordnance maps of France, the heights of most principal points above the level of the sea are noted. With respect to slopes, different degrees of shading might be used advantageously for mountain ground, the gentle inclinations being lightly, and the steep places deeply, shaded. In some Prussian maps, they had represented mountain ground by circular lines at assigned distances; the lines being very near for considerable slopes. An objection to this plan is that an engraver aims at a degree of accuracy which he can rarely arrive at: he cannot easily possess sufficient data to put the lines all round a mountain with any tolerable degree of accuracy.

"*Stone-planing Machine.* Mr. Carneghie, in reply to a question from the president, stated that the stone-planing machine had not answered for sharp

sandstone; but by endeavouring to imitate the mason's tool, and making the machine work in the same manner as the mason, they had succeeded completely. This tool was a comb with teeth; and, curiously enough, he had found at Dresden a tool, which had been in use from time immemorial, exactly similar to that which they had adopted.

"*May* 30.—*Warming and Ventilating.* On Warming and Ventilating, by J. Horne, F.R.S.; A. Inst. C.E. In this paper the author describes a method of warming and ventilating, on the principle of spontaneous ventilation, by means of an iron stove, care being taken that the *quality* of the air is not affected by the iron plates exceeding a certain temperature; and mentions a successful attempt to warm and ventilate a chapel on the same plan.

"Mr. Horne gives, also, an account of a method which he had adopted to ventilate an extensive drift or level, by forcing in air. The machine, a drawing of which, with all the details and dimensions, is annexed, consists of an upper cylinder, inverted, and working in a lower cylinder, nearly full of water. An attempt was at first made to ventilate by drawing out the foul air; this, however, did not succeed. The level is 7 ft. high, and 4 ft. 6 in. wide, and driven a mile before a rise into an upper level: the rise was then put up 400 ft. in height: both level and rise were ventilated successfully by this apparatus. The diameter of the ventilating pipe was 5 in., its length a mile. This showed most satisfactorily, that ventilation could be effected by forcing in air through a great length of pipe.

"*June* 6.—*Ventilation.* The subject of forcing air through pipes and of ventilation being resumed, Mr. Cottam stated a case in which a circular blowing machine, having a straight pipe 10 ft. in length and 6 in. in diameter, was sufficient to supply three furnaces, but that a single elbow rendered it incapable of supplying one.

"Mr. Oldham of the Bank of England stated that, in all the attempts which he had made to effect any purpose, he always endeavoured to imitate nature. Now nature supplies a large quantity of air slowly heated. He had consequently established a stove with a very large heating surface, and a pump capable of delivering 50 cubic feet per stroke. To get rid of the foul air he made large openings in the roof, and took care that there should be an abundant supply of air properly heated. The air is brought in at a temperature of 180° F.; thus there is a rapid change of air; and a summer heat is obtained without any sense of oppression. The success which had attended this system, during two frightful seasons of typhus and cholera in Dublin, would be attested by many medical men: in the middle of winter he kept the doors and windows open, and threw in abundance of warm air.

"*June* 13.—*Ventilation.* Mr. Oldham resumed the account of his system of warming and ventilating, and exhibited a model of his stove for heating the air. He was convinced that the expedient of forcing the air by mechanical means must be resorted to. He had raised the temperature of a room 24° F. in one hour: by spontaneous ventilation he could never obtain a temperature of more than 100° F.; but by pumping in the warm air he readily obtained a temperature of 150° F., or 180° F.

"*May* 30.—*Friction of Air in Pipes.* Some conversation took place on the power expended in producing this ventilation, and on the friction of air forced through pipes; and reference was made to several cases, which seemed to show that air could not be forced with effect through a great length of pipe, as for the purpose of blowing blast furnaces, whereas some experiments seemed to show that air could be forced through small pipes of 50, 100, or 150, in length, with the same velocity, under a given pressure.

"Mr. G. H. Palmer stated that, if 100 cubic feet of air could be forced through a small hole, under a pressure of *one* inch of water, in a given time, only 25 cubic feet would be delivered, under the same pressure, through a pipe of 1000 ft. in length, in the same time.

"Mr. Hawkins stated that, in the old Thames tunnel, a 2-in. pipe had been found quite insufficient for ventilation at a distance of 400 ft., but that a 3-in.

from the same bellows, and under the same pressure, had been quite sufficient. In the former case it was suggested, that the friction of the pipe was nearly the same as the pressure in the bellows, so that the air was simply condensed.

"Several other instances and experiments were quoted, and it appears that we must often consider whether the condensation has had time to take effect. The air may be condensed rapidly and none forced out, but, if the operation, takes place slowly, the condensation will have time to take effect.

"*June* 13.—*Voussoirs of an Elliptic Arch.* 'A practical Method of forming the Stones of an Elliptic Arch; by William Bald, Civil Engineer, F.R.S.E., M.R.I.A.' In presenting this paper to the Institution, the author has no object in view but to leave a record of the proceedings of an operation successfully carried into execution more than 17 years ago. This consists in the application of the well-known property of the elliptic, 'that the lines from the foci make equal angles with the tangent at any point.' The moulds are thus traced out by drawing a few straight lines.

"This plan was adopted in the construction of a bridge over the Owen-More river, in the west of Ireland; and a model of the two courses of the cutwaters of this bridge was presented to the Institution. In these courses the stones are cut so as to break joint with each other, and the blocks are connected together into one course, after the manner so ingeniously devised in the construction of the Eddystone."

ART. IV. *A practical and scientific Treatise on calcareous Mortars and Cements, artificial and natural; containing Directions for ascertaining the Quality of the different Ingredients, for preparing them for Use, and for combining them together in the most advantageous Manner; with a theoretical Investigation of their Properties and Modes of Action. The whole founded upon an extensive Series of original Experiments, with Examples of their practical Application on a large Scale.* By L. J. Vicat, Engineer in Chief of Bridges and Roads, formerly Pupil of the "E'cole Polytechnique," Member of the Legion of Honour, &c. *Translated, with the Addition of Explanatory Notes, embracing Remarks upon the Results of various new Experiments,* by Captain J. T. Smith, Madras Engineers, F.R.S., Associate Member of the Engineers' Civil Institution, late President of the Edinburgh Philosophical Society. 8vo, 302 pages, 3 plates.

SINCE the publication of Dr. Higgins on *Cements and Limes*, no English work on the subject has appeared; and, therefore, the present one, by the French engineer Vicat, and the English engineer Smith, will be received with satisfaction by that portion of the public to whom such works are interesting. The merits of M. Vicat's researches into the composition of mortars and cements are well known; and, though his work was published in 1818, it has not before received an English dress. How this happened to be given to it by Mr. Smith will best appear in his own words:—

"Having been occupied for many years in the construction and repairs of numerous public buildings, the charge of which devolved upon me in the performance of staff duties, I was long embarrassed in the endeavour to give durability to works executed under my superintendence, by many difficulties

arising from the defective qualities of the cements employed, the dampness of the situation, and other causes, at the time unknown. Anxious to remedy these evils, I engaged in a series of experiments, in which numerous modifications of the processes previously employed, and every suggestion which could be gleaned from the scattered hints contained in the writings of the various English authors, who have incidentally touched on the subject, were put to trial; both with reference to the durability of the compounds, as well as their economy on the large scale. But, although these endeavours were followed by many promising results, it was not until I became possessed of M. Vicat's work that the theory of the composition of mortars and cements was developed in a sufficiently satisfactory and comprehensive manner to enable me to take a full view of the varied resources, found within the limits of almost every locality, for the fulfilment of the objects of which I was in search. But, systematic and plain as M. Vicat's instructions and experiments are when well understood, yet it is not without much labour, in repeating many of the experiments, and the perusal of other French authors on the same subject, that I was enabled to overcome the difficulties occasioned by my imperfect acquaintance with the exact meaning of the numerous technical terms employed in it, and fully to appreciate the originality and appropriateness of the experiments, and the depth and philosophical accuracy of the reasoning founded on them. Having surmounted these obstacles, and felt the great value of the copious information placed at my disposal, I could not look back upon the pains which it had cost me to effect my object, without being led to consider, that others, similarly situated with myself, might have the same impediments to contend with; and that I might assist future enquirers by placing the labours of M. Vicat within the reach of those who might possess sufficient leisure to give that attention to his work which I had found to be indispensable." (p. vi.)

The chapters are, 1. Of Limestones; 2. Calcination of Limestone; 3. Artificial Hydraulic Limes; 4. Slacking of Lime; 5. Hydrates of Lime; 6. to 9. Various Ingredients which unite with Lime in the Preparation of Calcareous Mortars and Cements; 10. to 16. Combination of the Elements of various Mortars and Cements. These chapters occupy 140 pages; and the remainder of the work, which extends to 256 pages, exclusive of the Index, is occupied with Capt. Smith's notes on M. Vicat's chapters. These notes add greatly to the value of the work; of which it is almost needless to say, that it ought to be in the possession of every architect, builder, and engineer.

ART. V. *Le Keux's Memorials of Cambridge; a Series of Views of the Colleges, Halls, Churches, and other public Buildings, of the University and Town of Cambridge, engraved by J. Le Keux from original Drawings, made expressly for the Work; with historical and descriptive Accounts of the Buildings, &c.* By Thomas Wright, M.A., of Trinity College, Cambridge, and English Correspondent of the Historical Commission appointed by the Government of France. No. I. 8vo. To be completed in 48 monthly Numbers, at 1*s.*; or in 4to, 2*s.*; or with first impressions on India paper, 3*s.*

THIS is the commencement of a work which cannot fail to be interesting, not only to architects and antiquarians, but to every

one who has either been educated himself, or has had any of his children educated, at the university of which it treats. The engravings in the present number are two exquisitely beautiful views: the one the Library of Trinity College, and the other the Great Court, Trinity College. Besides these, there are two vignettes, on wood. The letterpress is one sheet. The work well deserves, and undoubtedly will obtain, success.

ART. VI. *Catalogue of Works on Architecture, Building, and Furnishing, and on the Arts more immediately connected therewith, recently published.*

DRAKE's Roadbook of the Grand Junction Railway, from Birmingham to Liverpool and Manchester. Containing a brief historical and topographical Account of the Scenery, Places, and Objects on either Side of the Line (as observed by the passing Traveller in their Order of Appearance); the Rules, Regulations, Fares, Times of Outset and Arrival of the Trains at the various Stations; and an accurately engraved Map of the whole Route. Together with an Appendix, containing all requisite Information for Travellers arriving at the various Stations. Small 8vo, 184 pages. Price 2*s.*

Original Geometrical Illustrations. By John Bennett, Engineer.

Appendix to Elements of Architectural Criticism. By Joseph Gwilt.

ART. VII. *Literary Notices.*

A PRACTICAL Treatise on warming Buildings by hot Water, and an Enquiry into the Laws of radiant and conducted Heat. To which are added, *Remarks on Ventilation, and on the various Methods of distributing artificial Heat, and their Effects on Animal and Vegetable Physiology.* By Charles Hood, F.R.A.S., &c. With numerous Illustrations. 1 vol. 8vo. 10*s.* 6*d.*

On the Public Works of Great Britain. In royal folio; with 150 plates of railways, tunnels, canals, &c.; with descriptive letterpress. 3*l.* 15*s.*; or the railways separately, 2*l.* 2*s.*

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A most excellent work, much wanted, and which we would strongly recommend to the young architect.

Papers on Subjects connected with the Duties of the Corps of Royal Engineers. 4to. Plates. 15*s.*

Simms's Sectio-Planography: a description of Mr. Macneil's method of laying down railway sections. Plans, with folio plates. 4to. 2*s.* 6*d.*

Simms's Treatise on the principal Mathematical Drawing Instruments employed by the Engineer, Architect, and Surveyor. Plates. 2*s.* 6*d.*

Remarks on Capt. Alderson's Report on the various Lines of Railway to Brighton. 1*s.*

MISCELLANEOUS INTELLIGENCE.

Art. I. *General Notices.*

Pompey's Pillar. — In a letter of Captain Smyth's, who made the survey of the Mediterranean shores, we find the following dimensions of Pompey's Pillar, contained in a work recently published, entitled *Voyages up the Mediterranean, with Memoirs compiled from the Logs and Letters of a Midshipman* (Mr. W. Robinson). "While we were at Alexandria," says Captain Smyth, "I wished to make some observations with a theodolite from the summit of Pompey's Pillar; and, as there are so many accounts of its dimensions, I determined to have the exact measurement. With a kite, we conducted over a small line: this pulled over a larger; and so on, till we got a regular set of shrouds rigged; and we rattled them with oars and handspikes. I now send you a copy of the dimensions, the first as obtained by a micrometric instrument, and the second by a very careful measurement with a line and rule, so that we may now say that we have the true size of this noble relic of antiquity."

MICROMETER.

	Ft.	in.
The Capital - -	9	10
Shaft - -	67	8¾
Base - -	5	10½
Pedestal - -	14	11
Whole height -	98	4¼

	Ft.	in.
Summit to the astragal	10	4¾
Astragal to the torus -	67	8
Torus to the ground -	21	4
Whole height -	99	4¾

	Ft.	in.
Upper circumference	24	2
Central ditto - -	27	1¾
Lower ditto - -	27	7½

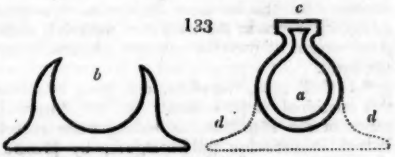
	Ft.	in.
Pedestal square -	14	5½
Capital square -	11	9
Ditto diagonal -	16	10½

From these dimensions, the lower diameter appears to equal 8 ft. 9·252 in.; and the upper diameter, 7 ft. 8·304 in.; and, from the circumference at the centre, the diminution of the shaft seems to commence from the base, instead of at one third the height of the shaft, as is usual. — *M. I. B. A. London, Oct.* 1837.

Wages of Workmen. — At the late meeting of the British Association, several gentlemen expressed their regret that a better understanding did not prevail between the masters and the men; and certain societies, established in some of the manufacturing districts of France, for the consideration of matters relating to trade (consisting of six of the masters, six of the men, the chairman being a master), were mentioned as worthy of imitation in

this country. Several instances were mentioned in which extensive mischief had been done, both to places and individuals, by these turn-outs; especially the removal of Mr. Heathcote's bobbin-net manufactory into Devonshire, whereby 2,000 hands were thrown out of employment in the district from which he removed. Mr. Merritt mentioned the turn-out at Liverpool, four years ago, of all the workmen conected with the building trades, estimated at 16,000 in number. The objects they proposed to themselves were principally three: first, to put an end to building by contract; secondly, to obtain the same wages for a smaller quantity of work; and, thirdly, to include all workmen in the union; in all which objects they signally and completely failed. Several other striking facts were mentioned, all tending to show, that in every struggle of this kind the men have always been ultimately defeated.

Ruthven's Improvement on Iron Rails for Railroads. — Mr. Ruthven of Edinburgh has bestowed much time and labour in contriving a form of a rail which, he thinks, will be found to possess material advantages over the wrought-iron rails now in use. The subjoined figures represent a section of the rail (*fig.* 136. *a*) and the chair (*b*).



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The rail (*a*) consists of a tube of cast-iron, about 4 or 5 inches in diameter, and thicker below than above. At top it extends upwards, leaving a flat surface (*c*) for the wheel of the carriage. It is formed in lengths of 9 feet or more, and has a chair, marked by the dotted line *d d*, cast on it at the middle, and, of course, immovable. The chair for joining the ends of two rails is of the form *b*. Its curved interior exceeds a semicircle; so that it embraces and retains the rails without any pins.

The advantages of this invention, in Mr. Ruthven's opinion, are the following: —

1. The hollow rail (the bottom of which, it must be remembered, is one half thicker than the sides and top) is much stronger than a solid rail of the same weight and materials. 2. The tubular form is a security against its bending laterally outwards or inwards. 3. The joined ends, being embraced within the chair, are more effectually secured from springing up than in the usual way, by pins; while the rail is prevented from rolling in its seat by the fixed chair *d d*. 4. The longitudinal contraction or expansion of the rails, by variations of temperature, is provided for by the absence of the pins, without producing any looseness. 5. He thinks cast iron might be employed in this way for rails, instead of malleable, with a great saving of expense; and it is allowed, we believe, that, except for its frangibility, cast iron is the preferable material. The form, however, is quite consistent with the use of wrought iron. He has had some lengths of the rails cast; and he has found by experiment that a yard of it, weighing 48 lb., placed with its two ends on rests, supports a weight of more than ten tons.

We think there is merit enough in these rails to deserve a trial, which could be easily made by laying a space of 20 yards with them, in some of the existing railways, where locomotive engines are used.

We mentioned, some time ago, that Mr. Ruthven was erecting one of Avery's engines (an American invention), which works by the reaction of steam, without beam, crank, piston, or valve. It is now ready, and will be at work in his own premises as soon as the masonry and external parts are completed. (*Scotsman*, Aug. 26. 1837.)

The following account of Mr. Ruthven's rail has been addressed by himself to the editor of the *Scotsman;* that intelligent and scientific gentleman having, with his usual attention to every description of improvement, given the notice of it which we have just quoted.

" Having for many years devoted much attention to this important subject, it may be considered as the result of well-matured investigation; and, although it may surprise many that there should be any difficulty in deciding on the best *form* of rail that can be adopted, after the experience had in the various railways established both in Europe and America, yet it appears that much misconception in regard to the proper *form* is still entertained. For instance, the rails on the Liverpool and Manchester Railway, without being greatly varied in form, have been changed in weight from 35 lb. to 75 lb. a yard. The expense attending such a change need not be stated: this and many others are proof how far the strength and weight of rail has been considered necessary more than the form.

" It has been supposed that a proper knowledge of the strength of iron was generally known, and that nothing more was required but to increase the weight of rails, and the desired object would be attained. It may be demonstated, however, that *form* is equally important as weight. All admit that a tube is much stronger than the same quantity of material in a solid body. It may also be supposed to be admitted that the rails give resistance to the carriages, or weight on them, by the tension of the metal on the under side, and compression on the upper. Many interesting experiments have been made to ascertain the relative strength of rails, and compare one kind of iron with another; but this has been done more to ascertain the proportional strength in the difference in the weight of material, than in the variety of form; for a given weight of material appears hitherto to have been more considered than the form.

" I shall now, therefore, call your attention, and those connected with this national improvement, to the interesting fact, published in your paper of the 16th inst., as having been stated at the recent meeting of the British Association in Liverpool, by Messrs. Fairbairn and Hodgkinson; viz., ' The next experiment was on castings of a T form, or resembling railway rails, which were broken with the flange both upwards and downwards. In the first experiment, with the flange downwards ⊥, the bar of cold blast iron bore a weight of 1050 lb. They then reversed the bar's position, putting the rib downwards T, and the bar broke with a weight of only 266 lb.; so that there was a great difference, and this was of great importance in reference to the *shape* of *rails*, beams, &c., for bearing heavy weights.' This is certainly too important to be passed over without particular notice, and is the point to which I wish to call attention. The rail proposed by me is tubular; and, being laid horizontal, increased strength is gained by increase of thickness on the under side of the tube, producing similar effect to the above ⊥ bar, which in this position made a difference of strength in the ratio of 1050 to 266 over the former T. But the improvement in strength is made greatly more than the ⊥ form, by continuing the flange, until it meet the bar at the upper side on which the wheels run, as shown in *fig.* 134.; for a rail 134.

weighing 48 lb., in this form, is able to sustain, without fracture, a pressure of upwards of ten tons bearing on the centre of it. By this circular or tubular form, in addition to general strength, the rail is secured against *side deflection*, which takes place in the rail at present in use, destroying the power employed, and the rail itself to a great extent, and is generally the cause of a carriage running off the railway.

" This, then, may be considered as two important objects gained; that of strength with less materials, and avoiding deflection both vertical and horizontal. The chair at the joinings is the next point to call attention to. The hollow rail being circular, the chair is formed to embrace more than a half of the tube, as illustrated by the diagram given in your paper of the 26th ult., which most effectually secures the rail from rising, or, indeed, every motion (except expansion or contraction), merely by the *form*, which supersedes the necessity of locking or keying as hitherto, and avoiding the disagreeable shake in passing over the joinings of the rails; this, therefore, may be stated as a third improvement; as a fourth, the saving of expense, which will be found,

cæteris paribus, to be greatly less than those at present in use. I have it not in my power to make these rails on a great scale; but I have some yards ready to exhibit to the public, and shall be happy to give every information desired to those who may consider it deserving their attention. — I am, Sir, &c." (*John Ruthven*, in *Scotsman*, Sept. 23. 1837.)

Art. II. *Foreign Notices.*

FRANCE.

Monument to Joachim Murat.—The Council-General of the department de Lot has just voted 5000 francs towards erecting a monument at Cahors to the memory of King Joachim Murat, who was a native of that district. Subscriptions have also been opened for the purpose. Madame Murat, now Countess de Lipano, has presented the department with Gerard's portrait of her husband. (*Paris Paper.*)

The Antiquarian Commission for the Côte d'Or have been continuing their excavations at the ruins of Alize, in the arrondissement of Semur, and have recovered specimens of the arts, which already form a valuable collection in the Museum of Dijon. They have also made some researches near the sources of the Seine, and have discovered traces of an ancient temple, supported by columns in the purest style, and ornamented in the interior with rich marbles. Fragments of capitals and mosaics of porphyry and bronze, as well as numerous Roman medals, have been brought to light; and, as these works are continued, the existence of a grand monument, which, according to tradition, was erected by the Romans on this spot, will be probably established. (*Paris Paper.*)

GERMANY.

Eye-shaped Windows. — The peculiarity of this place, and one which kept us laughing at the recollection for nearly a mile after we left it, was the windows in the roofs of the houses. They are shaped exactly like eyes: the tiles swell up gradually like a lid above and below, elongating towards the end; and in the oval space between these twinkles the little bright window pane, just in the place of the pupil. It was, in fact, as exact a model of the human eye as could be made out of such materials. I never saw any thing so funny. The whole village had an *éveillé* Argus-like look, that was irresistibly droll; all the houses laughing, and blinking, and peeping at us as we drove in. The shape being long, and the lower lid rather straight, gave them a sly, sleepy, half closed expression, and, withal, a look of fun and merriment, as if the house were "holding its sides" with laughter. Sometimes we came to a great Cyclops building, with its one staring optic in the middle of the roof; and then appeared a comical intelligent-looking thing, with a pair, that twinkled and screwed themselves up at us as we passed, in the most provoking and impertinent manner possible. It was really too bad. (*A Lady's Souvenirs of a Tour in Germany.*)

The Glyptotheca at Munich. — A book recently published, called the *Spas of Germany*, by Dr. Granville, F.R.S., contains an admirable account of that magnificent building, the Glyptotheca at Munich; and, being accompanied by a plan and elevation, is well worth the attention of architects. The doctor appears to be an amateur architect, and some of his observations are sensible and judicious. He touches at some length upon the new Houses of Parliament; and I, for one, most cordially agree with the opinion he expresses as to a change of the style to be adopted in these buildings. I would infinitely prefer an edifice rivalling the glories of ancient Greece or Roman architecture, to the perpetuation of a style which is the representative of a dark and ignorant age; and which is, besides, ill adapted for the purpose. Although I am

convinced that the works could not have been entrusted to an abler man than Mr. Barry, yet I cannot but regret, as many others do, that his genius has been restricted to one particular style. Could not our legislators be induced to pause ere it be too late, and rescind their Gothic decree? Should this be the case, I believe, as Mr. Hamilton, in his able *Letter to the Earl of Elgin*, says, that Mr. Barry's "well-known abilities, and his own purer taste, will readily and heartily respond to the instruction: all the Gothic barbarities will vanish with a stroke of the pen; buttresses will be instantly transformed into columns or pilasters, pinnacles into capitals, and towers into pediments; the windows will expand, and assume their proper proportions; armorial bearings and heraldic symbols will give way to more appropriate historical decorations; and, as the Roman public applauded when Michael Angelo transformed the sharp and angular projections and broken members, and other trifling, half Roman, half Gothic, impertinences of San Gallo's model of St. Peter's, with a diminution of expense too, into a style which combined the correct forms of the antique with the elegance and beauty of the more modern principles, which he had already brought into vogue amongst men of judgment, we shall hail the exchange of light for darkness, of truth for illusion, of majestic simplicity for cumbrous ornament, and of reason for licentiousness." Now that the noble architecture of Greece is beginning to be fully understood and duly appreciated, it will indeed be a reproach to us if, neglecting so fine an opportunity for its display, we tacitly confess ourselves unequal to the task of producing a building superior to those erected by our rude and uneducated forefathers. — *G. B. W. London, Oct.* 9. 1837.

BELGIUM.

Town Embellishment Society. — A company has just been formed under the name of "Civil Society for the Enlargement and Embellishment of the Capital of Belgium." The object of this new company is to build new quarters within or without the city of Brussels, particularly a quarter between the Louvain and Namur gates, to be called the Quarter Leopold. The capital of the company is five millions. The affairs of the Society to be managed by seven directors, without salary, and a secretary. This Company is formed between the General Society, the Society of Commerce, the National Society, and another society. (*Morn. Chron.*, Oct. 20.)

Madame Malibran's Monument at Brussels. — The design of the above monument has been at length decided upon. It is to be in form of a rectangular chapel, with a cupola, surmounted by a cross. A splendid white marble figure of the celebrated *cantatrice*, in her favourite character of Norma, will be placed in the interior, which will be lighted by a lamp from the dome. The figure will be perceived to great advantage through the fretwork of the intervening spaces; and the whole, when completed, will form one of the most interesting embellishments to the capital. (*Morning Chronicle*, Sept. 20. 1837.)

SPAIN.

Spanish Architecture. — Don Manuel de Godoy, Prince of Peace, in his *Memoirs*, vol. ii. p. 207., mentions the names of the following Spanish architects of his period: — Don Ventura Rodriguez, Don Francisco Sabatini, Villanueva, Arnal, Lopez, Freyre, Don Francisco Martinez de la Torre, Don Joseph Asensio, and Quintilian. He mentions, also, that Don Joseph Ortiz de Zanz, librarian to the king, was commissioned to make a translation of the works of Andrea Palladio, to which he added some useful commentaries; and (at p. 241.) that Don Joseph Castañeda executed a translation of the *Abridgment of Vitruvius*, by Perrault. So little is known of Spanish architects or architecture, that we should be glad to avail ourselves of any authentic information on the subject. The recent work of Roberts, which contains such beautiful views of many of the splendid edifices of that country, is sufficient to excite our curiosity. It is true, that Spain has been generally indebted to Italy for her architects; but there have been many native artists whose works are not devoid

of much merit, although they may not equal in purity the more classic models of the Palladian school. Still, there is richness and originality of design in many Spanish edifices; and we would fain be more intimately acquainted with the history of this portion of European architecture. Mr. Owen Jones has made another journey to the Alhambra; and is possibly there now, with the view to complete his studies of the Moorish architecture and peculiar style of coloured embellishments, to which those extraordinary edifices owe so much of their attraction. We trust that he will return with a rich harvest of materials, and meet with that encouragement which one deserves who, at so considerable a risk, and with so much study and perseverance, has undertaken to illustrate this remarkable style of architecture. — *M. I. B. A. London, Oct.* 1837.

RUSSIA.

St. Petersburg, Oct. 7. 1837. — The first public trial of the iron railroad to Zarskoji Selo was made to-day. It is five versts in length, and begins in the midst of the city, near the church and parade of the Seminow regiment of the guards. The price of 2½ rubles for seats in the first and second carriages is considered to be much too high for such a distance. (*Newsp.*)

A Gas Company is at present laying down pipes at St. Petersburg; so that in the course of the present autumn, a part of the city will already be lighted with gas. A second company has likewise been formed there, to supply the shops with portable gas. (*Morning Post*, Sept. 13. 1837.)

Art. III. *Domestic Notices.*

ENGLAND.

The London Water Companies. — Our readers will recollect that, a few years ago (see *Architectural Magazine*, vol. iii. p. 365.), much was said in the newspapers, and in the reports by Mr. Telford and others laid before Parliament, respecting the impurities of the Thames water, as supplied by the water companies to the inhabitants of the metropolis. It appears that an attempt is now making by the three grand companies, which received their water from the Thames, to remedy the evil, by lifting the water into immense basins, there to deposit its mechanical impurities, before being conveyed to the supply reservoirs in the immediate vicinity of the metropolis. The Grand Junction Company are seeking for purer water further up the river, and forming their reservoir at the east entrance of Brentford, upwards of 6½ miles from their reservoir at Paddington. The cast-iron pipes which communicate between the two reservoirs are 2 ft. 6 in. in diameter within, and 1 in. thick. They are in length between 8 ft. and 9 ft.; and the joints, which are of the spigot and fauset kind, will require about 1 cwt. of lead each. The total expense is estimated at 8*l.* per yard. The engines for lifting the water out of the Thames into the reservoirs, and for forcing it along the cast-iron pipes, have a power equal to that of 500 horses. Contrary to what might have been expected, the level of the reservoir at Paddington is about 86 ft. above the works at Brentford. The West Middlesex Company are forming a similar reservoir on the Surrey side of the Thames, opposite their present engine in Hammersmith parish, the water from which will cross the river, and be forced along to the supply reservoir at Kensington Gravel Pits. The Chelsea Water-Works Company are also forming a reservoir in Battersea Fields. So far the mechanical impurities of the Thames water will be diminished; but the chemical impurities noticed by Dr. Granville and others will remain the same. Perhaps the simplest mode of getting rid of these would be by a system of intercepting sewers, such as we have already suggested in different parts of this Magazine; or, what would perhaps be much cheaper, the establishment at the outlet of each sewer, before the water entered the Thames, of a steam-engine, to pump

it up, and force it along pipes to the distance of several miles in the country, where it might be used for the purpose of irrigation, or delivered to a basin or canal for the purpose of deposition. We have already, in the *Gardener's Magazine*, suggested a plan of filtering the water before forcing it along the pipes; of separating the mechanical impurities unfit for manure, such as stones, bricks, glass, &c.; and of compressing the manure into cakes, which, like oil-cake, might be sent to any distance by land or water. One great obstacle to every scheme of this kind will be, at least for a generation to come, the difficulty of getting the farmers, within 20 miles of London, to set a due value upon liquid manure. As to the solidified matter, the farmers in the north of England and Scotland, and even on the coasts of France and Germany, would purchase that in any quantity. Perhaps it may, at some future period, be practicable, in point of expense, to intermix some liquid with the water of the sewers, after it has been filtered, so as to dissolve the chemical union and precipitate the deleterious matters; but this, from the expense, is perhaps too wild a speculation to be hazarded at present. If it could be done, a great accession of valuable manure would be obtained in a solid form; and the pure water might be run off at once into the Thames.

Very few persons have any idea of the immense quantity of valuable manure which is carried off from every town and city by the common sewers. To be duly impressed with this, it is necessary to form a rough estimate of the extent of ground which may be manured by the liquid manure formed by a single family of, say, 8 or 10 persons, where the family washing is done at home. From our own observation and trial, we think a safe calculation for a family of 10 persons, including children, in the environs of London, living as people in moderate circumstances usually do, would be one acre. We feel confident that this is under, rather than exceeding, the amount; though, in country places, where the manner of living is quite different, and the quality of the food very inferior, the same estimate might not hold good, at least in the same degree. Supposing the rate of 10 persons to one acre to be a tolerably near approximation to the truth, and taking the population of London at 1,500,000, then the number of acres that this population would manure is 150,000, or a circle the diameter of which is about 17 miles; say, allowing for the space occupied by houses, a radius of 10 miles all round London, which we may suppose to occupy a circle of 4 miles in diameter. As the liquid manure would necessarily cost fully as much to force it from the town into the country, and to distribute it there over so immense a surface, as is required to force the pure water from the country to town, and to distribute it to the different houses, it follows that the cost of manuring 150,000 acres would be about the sum paid by the inhabitants of London to the water companies; viz. from 150,000*l.* to 200,000*l.*, which is from 20*s.* to 25*s.* per acre. What might be the probable amount of the solid manure procured either by mechanical filtration by machinery at the mouths of the sewers, or by deposition by gravitation in immense basins, or, what would be better, in long narrow canals parallel to the Thames, from Blackwall to Gravesend, we have no means of forming an estimate. We have no doubt, however, that the manure obtained by mechanical filtration, if afterwards compressed and rendered portable, would sell; and we think that mechanical filtration at two or three points along each sewer, and afterwards forcing the water by a steam engine, from each point, in iron pipes, into the canals for deposition, would be a better plan than any which has yet been suggested. At all events, it is a plan which might be tried on a small scale, and, if not found to pay, it could be relinquished without much loss.

We observe that a company is formed to carry Mr. Martin's plan into execution (see Vol. III. p. 360.), which, we hope, will lead to some useful results; because, at all events, it will direct public attention to the subject. The vice-presidents and the directors include a great many names of persons of rank and distinction; and to these, we trust, will be added the names of some of our principal engineers. The objects of the company are, 1. To ex-

clude from the river, by intercepting sewers along its banks, the filth of every kind that now passes into it through the drains of London, and thereby insure a supply of pure water to the metropolis by the water companies; and, 2. To collect a supply of manure from the drains, so greatly superior to any other, as will effect a vast increase in the produce of every description of land.

The wooden Pavement proposed for Oxford Street cannot, I should think, be suitable for so great a thoroughfare; and I certainly do not see how the expansion and contraction of the blocks, from the variations of the weather, can be remedied. As connected with the subject, perhaps the following account of an *iron* pavement may be found worth attention: it is from *Walks through London*, by Dr. Hughson, 1817: —

"*Iron Pavement in London.* — Another material improvement is exhibited in Blackfriars Road, or Great Surrey Street, near the corner of Holland Street, in the application of iron in lieu of stone, as a substitute for pavement in the streets of this metropolis. This succedaneum consists of square pieces of cast iron, suitably shaped, roughed, and dovetailed. This experiment, made in the summer of 1816, has succeeded so far, that it has been resolved to pave some streets in the city in this manner, and to begin with Wood Street, Cheapside. It is computed that an iron pavement, well adjusted, will endure twenty years in a great thoroughfare; whereas it is too well known that a stone pavement very frequently requires repairs, and a new adjustment. The pieces already laid down resemble a batch of eight or nine rolls, and are united like the parts of a dissected map, without interstices, or even palpable joints. From their sustaining every kind of load, and the roughest of usage, there is no doubt of the ultimate success of this invention." Probably some of your readers may be able to supply further information upon this subject, and state why this paving has not been generally adopted. — *G. B. W. London, Oct.* 9. 1837.

The Wellington Monument. — I hope that the monument to commemorate the services of the Duke of Wellington, for which 10,000*l.* have been already subscribed, will be made worthy of the illustrious hero whom it is to honour, and of the nation whose gratitude it is to record. Let merit, and not interest, for once, be allowed to obtain a preference for the competing artists; and we shall then have something of a higher character than the Jack-in-a-box monument of Huskisson at Liverpool, or even than the testimonial to the noble Duke himself in Phœnix Park, Dublin. — *Id.*

New Houses of Parliament. — The first contract for the commencement of the works was entered into the beginning of last month, and they are, perhaps, the most important in regard to construction. They comprehend the formation of an embankment of 886 ft. in length, projecting into the river 98 ft. before the present embankment. The front will be in a line with the inner side of the third pier of Wesminster Bridge, in 4 ft. of water at low water; the whole to be surrounded by a river wall, 30 ft. high from the base, and 1141 ft. in length, with a curvilinear batter, and faced with granite. A terrace, 673 ft. long next the river, and 35 ft. wide, is to be formed in the front of the new houses, with an esplanade at each end, 100 ft. square, and landing stairs from the river, 12 ft. wide. The foundation wall of the front of the new building, the length of the terrace, and 30 ft. high, is included in the contract, as is also the whole surface of the front building, which is to be excavated and filled in with concrete, 12 ft. thick, forming a permanent and solid foundation for the superstructions; and a coffer-dam is to be made surrounding the work, 1236 ft. long, and 10 ft. wide, before they can be commenced.

The coffer-dam is to be first made by dredging a trench in the bed of the river, in the form of a segment of a circle, 27 ft. wide, and 8 ft. deep in the centre, which is done to allow the piles to be driven the more easily; two parallel rows of guide or main piles of whole timbers will then be driven at 5 ft. apart, leaving a width of 9 ft. between them transversely; to these piles will be fixed three tiers of walling of whole timbers, cut down and bolted together, one tier to be fixed at the top on a level with high water-mark,

another level with the bed of the river, and a third midway. The piles and walling are then to be bolted across with iron bolts, 12 ft. long, forming a carcase for the inner or sheet piling; and the inner main piles are firmly braced, to resist the thrust and pressure at high water. The whole of the piles are 36 ft. long, to be driven through the gravel, and into the clay substratum 2 ft.: the top of the clay is 28 ft. below high water-mark; within the walling will be two parallel rows of sheet piling, the outer or river side being of whole timbers, and the inner or land side of half timbers. After all the piles are driven, the gravel forming the bed of the river between the piles will be excavated down to the clay, and the space between, 34 ft. high and 5 ft. wide, will be filled with clay and puddled; and there will be fender or guard piles at 10 ft. distance from the coffer-dam, with floating booms, to prevent craft running against the works. After the coffer-dam is complete, the bed of the river will be excavated the whole length of the river wall, 39 ft. wide and 12 ft. deep, to form the terrace: the front and inner wall will be 24 ft. 9 in. high, standing on a course of concrete, 1 ft. thick: upon which will be bedded two courses of 6-in. stone landings: the lower thickness of the wall will be 7 ft. 6 in., and the top 5 ft., with counterforts 16 ft. apart, 3 ft. 9 in. wide by 3 ft. 4 in. deep: the back of the wall will be carried up perpendicular, and the front will be faced with granite, laid in horizontal courses, 2 ft. thick, with bond stone 4 ft. thick, and 6 ft. 6 in. apart: the face of the granite will form a curvilinear batter of 8 ft. 6 in. in 22 ft. At 30 ft. distance from the inside of the river wall, will be built the front wall of the new building, which is to stand on a foot of concrete, with two courses of 6-inch stone landing; the lower part of the wall is 6 ft. 4 in. wide, and the top 4 ft 6 in., and 24 ft. 9 in. high. Between this wall and the river wall, a space, 30 ft. wide, 673 ft. 9 in. long, and 27 ft. high, will be filled in solid with concrete, to form the terrace; the foot of the river wall will be protected by sheet paling of whole timbers, 8 ft. long, with a walling along the top, bolted with iron bolts, 6 ft. long and 4 ft. apart, with screws and nuts let into the stone landings of the footings. The river wall to the front and side of the esplanade will be 1 ft. 2 in., and 2 ft. 3 in., thicker than the terrace wall; and the whole surface of the esplanade will be excavated and filled in with a solid bed of concrete, 20 ft. thick. (*Kentish Gazette*, Oct. 24.)

CORNWALL. — *An Obelisk as a Lighthouse.* — The Trinity Board have ordered that an obelisk, surmounted by a pole with a hollow ball on the top, shall be immediately built on the height of the Black Rock, between Pendennis and St. Mawes' Castle. This obelisk will be of great service to mariners in making Falmouth harbour. (*West Briton.*)

Hackney Church and Tower. — It was said some years ago, of a certain building at Brighton, —

> "On the outside are teapots all pierced round with holes,
> Relieved by extinguishers mounted on poles."

However grotesque and barbarous they may appear, certainly they have not the clumsy awkward appearance of the pepper-box with which the tower of Hackney church is inflicted, and which, unfortunately, is a conspicuous object for miles around. It is an extraordinary fact, that this monument of architectural stupidity should ever have been erected; but it is still more extraordinary, if there is anything like taste in the parish, that it should be allowed to continue. (*A Churchman of Hackney, Oct.* 1837, in *Morn. Chron.*, Oct. 26.)

LANCASHIRE. — *Trinity Church, Blackburn.* The foundation stone of this church was laid on October 10. The site is considerably elevated above the rest of the town, and the spire will, in consequence, become a prominent object from the surrounding country; and thus, by forming a leading feature in the distant view of the town, produce an interesting whole of what has hitherto been a confused assemblage of objects, all claiming nearly equal attention. The architect is Edmund Sharp, Esq. The church will be "built in the form of a cross, with a lofty tower and spire at the west end. The length of the

church will be 130 ft., and the breadth 60 ft. The length of the transepts is to be 84 ft. The whole will afford accommodation in sittings to 1600 persons. The peculiarity of the design is most apparent in the east elevation of the building. Two large schools, capable of holding 600 children, are, by a judicious arrangement, assisted by the natural fall of the ground to the east, placed below the level of the plinth of the church, and extend to a distance of 60 ft. on each side of the church, thus forming a kind of basement to the building. They are lighted by a long row of simple lancet windows, and are separated by a sort of hall or council-room, for the teachers and visitors, which is situated immediately beneath the chancel, and which communicates by two flights of stone steps with the body of the church. This part of the building is entirely in the early English style of architecture; that is, in the style of the 15th century. Above these schools rises the chancel, with its side ailes conspicuous for a fine and large east window of seven lights, filled with bold and elegant tracery. Further back stand the transepts, and above all rises the tower with its lofty spire, the finial of which is 180 ft. above the sod at the west end, and 200 ft. above the base of the schools. The nave has columns and arches, with a clerestory, the windows of which are in pairs; these, as well as the aile windows, have good tracery. The spire, which will be so conspicuous an object from the surrounding country, in every direction, is pierced with small projecting windows in three heights. The whole of the church, exclusive of the schools, is designed in the style of the 14th century, and will, taken in conjuction with the latter, form a pile of building which is calculated to add considerably to the general appearance of the tower, and throw credit on the zeal of the reverend vicar, and the public spirit of the town. The following churches have been built within the parish of Blackburn, under the auspices of Dr. Whittaker, within the last eleven years: —

1.	Parish Church, St. Mary's, Blackburn,	consecrated	1826
2.	St. James's, Lower Darwen - -	do.	1829
3.	St. Mary's, Mellor - - -	do.	1829
4.	Trinity Church, Over Darwen - -	do.	1829
5.	St. Paul's, Blackburn - - -	do.	1829
6.	St. Stephen's, Tockholes - -	do.	1832
7.	St. Saviour's Chapel, Mellor Brook	licensed	1835
8.	Immanuel Church, Fenniscowles -	consecrated	1836
9.	St. Saviour's, Bamber Bridge -	do.	1837
10.	St. Mark's, Witton, not yet completed	begun	1836
11.	Trinity Church, Blackburn -	foundation stone laid	1837

Another, we hear, is shortly to be erected in Nova Scotia, Blackburn, and one also in the adjoining township of Livesey. (*Blackburn Gaz.*, Oct. 11. 1837.)

Wilts. — A monumental Pillar is now being erected on Wick Hill, in the parish of Bremhill, at the joint expense of Lord Lansdowne and the Rev. W. L. Bowles, as the lord of the manor, and vicar of the parish of Bremhill. On Sept. 14., Lord Melbourne, Lord John Russell, and the Marquess of Lansdowne, from Bowood, called at the Vicarage, and proceeded to the spot. The monument, on this elevation, will be a most picturesque object: it is already upwards of 30 ft. high, and the design is beautiful. (*Bristol Journal.*)

SCOTLAND.

Sir Walter Scott's Monument. — On Sept. 11., the foundation stone of a monument to commemorate the genius and virtues of the late Sir Walter Scott was laid in St. George's Square, Glasgow, with the usual masonic and other honours. The following is a copy of the inscription on the plate deposited in the foundation-stone: — "This Column, an humble Tribute to the Memory of Sir Walter Scott, Baronet, is erected by the Citizens of Glasgow, that it may record their admiration of his genius, their deep sense of the honour which his name reflects on his Country, and their gratitude for the delight which they have received from his writings. This Foundation-stone was laid by the Hon. William Mills, Lord Provost of Glasgow, in presence of the Magis-

trates of the City and Suburbs, &c. &c. &c., on the Second Day of October, MDCCCXXXVII., in the First Year of the Reign of Queen Victoria." — (*Glasgow Chron.*, Sept. 18. 1837.)

Art. IV. *Retrospective Criticism.*

Designs for Churches, &c. — I am a warm admirer of ecclesiastical architecture, and fully expected, ere this, to have seen in your Magazine (of which I am a constant reader) popular descriptions, with the requisite illustrations, of the following among other subjects; viz.: —

A description of the new Roman Catholic cathedral at Tuam.

An account of the extensive restorations and improvements which the venerable cathedral of Glasgow is at present undergoing.

Information respecting the improvements at the interesting church of Stratford upon Avon.

I perceive, by one of your recent Numbers, that a church is in course of erection in Lancashire, in the Norman style; and your Number for the present month (October) announces the progress of another, in the same style, at Dorking, in Surrey. Could you favour your readers with a copy of the designs of both or either of them? It is only from a periodical like yours that the public generally can obtain this species of information; and I trust that you will endeavour to supply them with it. I am happy to add, that it is understood here that the Bishop of this diocese intends to adopt measures for the restoration of our own venerable cathedral, by re-erecting it from the tower westward, a distance of about 175 ft.

I cannot help thinking but that you would render a very essential service to the public, at the present time, when so many additional churches are about to be erected, by communicating a series of the best designs, in the various orders of architecture, together with engravings of such (already erected) as may have received the approbation of the critic. — *An Amateur. Bristol, Oct.* 17. 1837. [We should be happy to comply with the request of our correspondent; but the necessary expense of engravings renders this, to the extent that would be satisfactory to him, quite impossible. — *Cond.*]

Art. V. *Queries and Answers.*

High Cliff, Lord Stewart de Rothsay's, near Christchurch, Hampshire. — I am informed that one of the most remarkable Gothic residences to be seen in England is being erected at this place. The entrance hall is sufficiently large to contain the old church, Marylebone. The outside of the building is covered with basso-relievos, collected by the noble proprietor, from Italy; and the interior is richly ornamented with *cinquecento* statues from the same country. My informant adds, that this castle is built on sandy clay, close by the sea shore, and that the waves are undermining the cliff at such a rate, that an embankment will very soon be necessary to preserve this building from being carried away. — *John Williams. Brighton, Sept.* 20. 1837. [We should be very much obliged to any of our readers who could give us some account, accompanied, if possible, with a sketch of this mansion, which we had ourselves, previously to receiving our correspondent's letter, heard was of great extent, and covered externally with curious sculptures.]

Roman Sewers. — Does any section exist of the Roman cloaca; or is it known whether either the ancients or the modern Italians practised the interposition of cystpools and hydraulic joints in their domestic communications with the public mains? — *J. R. Edinburgh, Oct.* 16. 1837.